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ESTABLISHMENT, MAINTENANCE, AND REINSTITUTION OF BREAST FEEDING *

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MINNEAPOLIS

Persistent demand on the breast is a most important and continually neglected factor in the establishment, maintenance and reinstitution of natural or breast feeding.

Normally, the flow of breast milk in the puerperium is supposed to be brought about by the hormones set free just before the milk "comes in." I have had no personal experience in the establishment of lactation without a preceding pregnancy. Many dependable authorities, however, vouch for the possibility of such a phenomenon when proper demand is made on the human breast, either male or female. Pfaundler's report of a calf which was suckled by other animals and produced normal cow's milk may also be cited as supporting the correctness of the cases reported among human beings.

The premature infant is usually incapable of furnishing the physiologic sucking stimulus necessary to support the hormones. When the importance of the continued demand on the breast is underestimated, the breast feeding fails. This is entirely unnecessary.

In the method used in such cases in the University of Minnesota new-born clinic and my private work, no attempt is made, except in slight degrees of prematurity, to put the babe at the breast at first. Both breasts of the mother are expressed regularly five or six times daily.

The expression is carried out as follows: The breast is grasped about 1 or 2 cm. back of the colored areola, and a milking motion is carried out toward the nipples. The nurses and mothers soon gain a manual dexterity which is surprising. No massage of the breast proper is allowed, as it is of little, if any, value, and sometimes causes traumatic inflammatory reaction. If we consider the anatomy of the breast, we learn that the ducts which contain the milk extend but a short distance back of the areola. Any one who has ever seen a cow knows that the teats are milked and not the cow's bag, and yet we often find head nurses, physicians and even pediatricians giving instructions to milk or "massage" the breast gland itself. If our method is intelligently followed, it is possible to keep the mother of the premature infant from losing her milk. I have seen some such mothers supply not only milk for their own babe, but also enough to supply a second infant.

I shall not discuss agalactia, as I have never seen such a condition and seriously doubt its existence. If the babe does not gain well at the breast, the trouble is practically always with the babe itself, or with the quantity but not the quality of the milk.

Let me cite a case in which the trouble was supposed to be with the quality of the milk:

I was called in consultation to see a baby who, at 8 weeks, weighed less than at birth. We weighed the baby before and after nursing. It received but 5 c.c. (one teaspoonful) of milk. The baby nursed unsatisfactorily; the breast gland was not being stimulated. The babe had hypothyroidism; for that reason it sucked imperfectly. Instructions were given to put the baby at the breasts regularly. The babe was weighed before and after each nursing. The breasts were then carefully expressed manually. The expressed breast milk was given to the baby and instructions were left to make up the caloric requirement with a simple milk mixture. Desiccated thyroid was also administered. The milk secretion increased rapidly, the babe began to suck better and gained in weight, and after a short period the complemental feeding was dropped.

When, for any reason, the breast milk supply is low, the amount that the child gets should be determined accurately by a balance, not by a spring scale. The child should be put to the breast and the infant's food requirement supplied by complemental, not supplemental, feeding, that is, the required amount of extra food should be given immediately after a nursing, not in place of a nursing. The pernicious practice of dropping a nursing and replacing it with an artificial feeding is one of the most frequent causes of the breast drying up and the loss of milk. The breast is not stimulated; it is, in fact, the best method of weaning the infant.

Breast feeding can also be established at a much later date by the same method:

I saw a babe at the age of 1 month that had never been nursed. It was possible to express a few drops from the mother's breasts. The mother was told that with her cooperation the breast secretion could be reestablished. The babe was put to the breasts regularly. Of course, the infant did not take the nipples well. The milk was carefully expressed after each nursing. The babe's caloric requirement was met with a simple milk mixture, given after the nursings, and the expressed breast milk. The babe was weighed before and after each nursing. After a week or ten days, the scales and expression showed a definite and progressive increase in the amount of breast milk secreted. At the expiration of a month of this treatment, when the infant was 2 months old, the child's gain in weight was satisfactory and, as the amount of mother's milk was sufficient, everything but the mother's milk was discontinued, and a successful lactation was carried out.

* Chairman's address, read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

In the maintenance of lactation the same attention should be given to keeping up the demand as in the establishment of lactation. The amount of breast milk obtained by the infant should be determined and the child's requirements met by complemental, not by supplemental, feeding. The breasts should be evacuated at least five times in twenty-four hours.

The success of relactation or reinstitution of breast feeding by making a demand on the breast furnishes more evidence in support of the importance of the demand which is made on the breast.

Zlocisti made a definite contribution to the subject of "relactation," as he terms it. He reported the reestablishment of lactation in several cases after the lapse of weeks and even after ninety days. I have no doubt of the correctness of his reports. I have tried his methods of putting the father to the breast, but feel that under our present social conditions we shall have more general success by the method we have used. It is unnecessary to give a list of cases at this time, but I cite one instance of success as typical:

A short time ago, I saw an infant, aged 4 months, which was having convulsions, spasmophilic in character, on unnatural feeding. The child had not had the breast for nine weeks. It had been taken from the breast because of illness of the mother. She had just returned from the hospital, in which she had had severe erysipelas followed by antrum trouble. The mother and babe were immediately taken to the hospital where the nurses had been properly trained in milking. The babe's spasmophilia was controlled by the daily administration of sufficient dosage of calcium chlorid, 75 grains daily, followed later by phosphorus in cod liver oil. The mother was assured that with her cooperation the milk could be brought back. The breasts were stimulated regularly by placing the babe at the breast. The babe refused to take the nipples at first. The milk was carefully and thoroughly expressed and the babe's nutrition was maintained by complemental feeding. For several days the results were discouraging, as but 3 or 4 drops were obtained. The number of drops gradually increased. Then the amount grew so that the product could be recorded in cubic centimeters. Lactation was finally established.

Confidence and technical skill are necessary in such cases. The end sought is, however, of enough importance to demand that the attending physician should exert as much patience and have as much skill as we expect of the surgeon who undertakes a major surgical procedure.

I have intentionally omitted reference to the other aids to the establishment, maintenance and reestablishment, and to the literature in order not to befog the main point of making the demand on the breasts. I do not pretend to have offered any new discovery.

We know enough now, from a physiologic standpoint, to save the breast milk for most of the babies that are now deprived of it. It has become a question of getting the information to the profession and the nurses and the public. It is largely a question of psychology now and not of physiology.

An Unbusinesslike Nation.—The merchant accepts past experience as a guide to the need of future supplies; the salesman counts on publicity and education to create a demand for his wares. Shall our cities or our nation ignore their greatest asset and fail to count the daily loss of lives as inexcusable? And yet—to our shame, be it said—we, who claim to be a civilized nation, have still so cheap a notion as to life and death that we are without a national registration law or uniform state laws demanding the reporting of births and deaths.—Haven Emerson, M.D., "Preparedness for Health."

THE TECHNIC OF WETNURSE MANAGEMENT IN INSTITUTIONS*

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CHICAGO

A large number of the babies brought to infants' hospitals suffer from gastro-intestinal disease caused by food disturbances. Most of them are given hospital attention after various attempts have been made to correct the disorders by food and medicine. Consequently the condition of these babies, on admission into the hospital, may be correctly described as serious. Most frequently they are toxic, either from disease or food, usually from both, so that the problem of detoxication is the immediate and pressing indication. After undergoing the short preliminary period of starvation, these desperately sick infants require not only a detoxicating agent, but food as well to sustain life. For both these purposes, nothing can compare in value to properly suited doses of breast milk. An infants' hospital, which necessarily must receive the babies who have been most neglected and who require the most expert treatment, should consequently have at hand an ample supply of breast milk.

TABLE 1.—DAILY QUANTITY OF MILK EXPRESSED BY WETNURSE R. F.*

Day of Month	Oct.	Nov.	Dec.	Jan.
	oz.	oz.	oz.	oz.
1	42	39	34	36
2	38	37	42	38
3	43½	35	34	36
4	36	37	37	37
5	34¾	36	38	34
6	33½	38	38	33
7	40	37	38	37
8	37	42	35	35
9	35½	36	39	35
10	40	36	34¼	39¼
11	42	36	36	37½
12	43	36	37	38
13	41	35	40	39
14	42	38	41	38
15	37½	36	34	43
16	49	34	37	35
17	45	35	40	35½
18	45½	36¾	35	33
19	46	37	35	33
20	40¼	37	38	37
21	40½	41	36	38
22	43½	38	37	33½
23	41	40	28	45
24	39½	36½	26	35
25	40	38	38	34½
26	40	38	31	35
27	41	25	27	26½
28	41	38	29	24
29	42	37½	31	22
30	43	36	31	22
31	36½	..	30	22
Totals	1,256 (39.25 qt.)	1,112.5 (34.76 qt.)	1,086 (33.94 qt.)	1,067 (33.65 qt.)

* Total amount for four months, 4,521.5 ounces (14.6 quarts); average daily amount, 36.84 ounces; largest daily output, Jan. 23, 45 ounces; previous occupation, telephone operator; primipara; married.

Although there is in Chicago at present no directory for wetnurses such as exists in New York and in Boston, we rarely have any difficulty in procuring wetnurses for the Sarah Morris Children's Hospital. The various maternity hospitals and foundling asylums cooperate with us, and are glad to secure positions for their inmates, since wetnursing will not separate them from their babies.

It has been found advisable to select women whose ages range from 20 to 30 years, although more depends on the qualifications of the individual than on her age. A nurse of phlegmatic temperament and good morals is preferable, though it is needless to say that moral

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

qualities are not transmitted through the milk. At the time of admission to the hospital, the baby of the wetnurse should be at least 3 or 4 weeks old. Before admission, the wetnurse and her baby must undergo a complete physical examination. The mother is examined carefully for pulmonary tuberculosis, and diseases of skin, glands and bones. The Wassermann examination is made in every case, and the vaginal secretion is examined for gonococci. In examining the child, the weight and appearance are taken into account. One must assure himself, at this point, that the mother is presenting her own baby for examination. It has happened more than once that a woman desiring to engage herself as wetnurse has presented some other woman's baby borrowed temporarily for the purpose of successfully passing the test. We must above all, in the examination, satisfy ourselves that the breast milk is sufficient in quantity and proper in quality. In view of the lack of more scientific methods, the quantity of a nurse's milk is judged by weighing her baby before and after an ordinary nursing. It may also be roughly estimated by expressing the milk by hand. If pressure is applied to the breast in a proper manner, the milk is caused to jet from the nipples in numerous streams expelled with considerable force. If, however, the milk slowly drips from the breast, the quantity may be considered deficient.

The quality of the milk is best estimated by examining the baby of the wetnurse. If the baby is in good nutrition, shows gain in weight, and has normal bowel movements, we may naturally assume that the milk is of good quality. We place little reliance on the chemical examination of breast milk as an index of its quality. The composition of the milk as expressed in chemical analysis varies so much during one and the same feeding, and during different periods of the day, that little reliance can be placed on this test.

After the wetnurse has passed the physical examination, she is admitted to the hospital, where she and her baby are provided room and board. There she receives a wage of $8 a week. She is required to do some light work, among other things, the laundry for herself and baby and the care of her own room. At the Sarah Morris Hospital it is insisted that she nurse her own baby, because by doing this she not only provides the best nutriment for the child, but also supplies a natural stimulation to her breasts. The wetnurse feeds her own baby at 7 and 11 a. m., and 3 and 9 p. m. Thus there is no chance for stasis to occur. The secretion of milk is reflexly stimulated by the sucking act. The more completely the milk is withdrawn the greater becomes the supply.

Since the foster babies in our institution are not put to the breast, the milk is procured for them indirectly. Breast pumps are not used because they have been found inefficient. The mother, shortly after her admission to the hospital, receives instruction from a trained nurse in the technic of expressing the milk manually. This method is rapid and results in no injury whatever to the breast. As much cannot be said of the pump when it is employed.

Milk is expressed every four hours during the day and night. All the wetnurses milk at the same hour under the supervision of a head nurse and assistants. Thus the operation is pretty well controlled. At the specified period, the nurse on duty brings to the wetnurses' apartment the required number of sterile medicine glasses, sterile bottles, and materials for cleansing the breasts. The nipples are first washed with sterile water. Then after cleansing her hands, each wetnurse seats herself at a table on which the tray bearing the above described equipment has been placed, and begins the manipulation by which the milk is expressed. It is to be noted that not the whole breast but only that part which corresponds to the areola is compressed. As this portion is being compressed, the breast is at the same moment drawn downward and forward. Following this method, the wetnurse soon becomes expert in emptying her breasts, so that it requires but a short time to complete the work.

The milk is received in sterile medicine glasses designed with flaring top and stem similar to goblets. This shape adapts them nicely to catch the milk as it streams from the breast. As soon as filled, they are emptied into sterile half-pint bottles. The nurse on duty remains in the room during the entire time the milking process is going on. It is necessary to exercise watchfulness in supervising the operation, because it has been our experience in times past that wetnurses have practiced deceit, either by diluting the milk or by substituting cow's milk for their own product.

TABLE 2.—DAILY QUANTITY OF MILK EXPRESSED BY WETNURSE L. T.*

Day of Mo.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
	oz.	oz.	oz.	oz.	oz.	oz.	oz.
1	39	35½	25	44	47	44	39
2	36	36	29	39	47½	38	40
3	39	37	26	40	56*	42½	39
4	46	37	33	49	43	45	41½
5	39	37½	38	48	44½	40	39
6	36	37	36	45	43	40½	39
7	42	37	39	44	43	39	40
8	45	38	38½	48	45½	41	39½
9	36	36	36	39	44½	39	39
10	37	33	39	46¾	41	39	40
11	36	39	40	..	45½	39	40
12	41	37	38	..	43	41	41½
13	39	37	35	44	44	..	41½
14	38	36	36	38	42	..	39
15	39	37½	37	36	..	..	40½
16	41	35	35	37½	44½	..	39
17	36	36	37	43	45	39	41½
18	36	..	38	36½	47½	39	39
19	39	33	37	39	45½	39	39
20	37	34	36	41	37	39	39
21	32	..	38	40	47	39	42½
22	33½	39	38	38	40½	39	39
23	37¾	39	40	37	48	39	42
24	36	39	40	41½	38	39	39
25	36¾	35½	41	38	42	39	38
26	35	34	38½	35½	43½	41½	35½
27	35	34	38	38	41	37½	38½
28	24½	29	44	39	39½	37½	41
29	36	27½	32	47	..	36½	40
30	39	27	40	50½	..	34	39
31	34	..	39	44	..	40	
Totals ..	1,156.5 (36.14 qt.)	992.5 (31.01 qt.)	1,136 (35.5 qt.)	1,206.5 (37.7 qt.)	1,188.5 (37.1 qt.)	1,067 (33.4 qt.)	1,190.5 (37.2 qt.)

* Total amount for 7 months, 247.3 quarts; average daily amount, 38.5 ounces; largest daily output, Feb. 3, 56 ounces; previous occupation, housemaid; primipara; unmarried.

In most instances the breast milk is used immediately after pumping. When an excess is obtained, it is transferred in sterile bottles to the refrigerator in the milk station, where it is kept until needed. The breast milk is reserved for those babies who are desperately ill and require to be tided over critical periods, for those suffering from marasmus, due to food disturbances or infection, to the premature babies, and to all who have been operated on for pyloric stenosis. The milk is administered in the same way that any formula is given. Those who are not too weak receive it from the bottle; those who are premature or too feeble to nurse are fed with the medicine dropper, the spoon, or by the Breck feeder; still others are fed by gavage.

We believe that the food for the wetnurse herself during lactation should be sufficient but not

excessive. It should consist, as nearly as possible, of the food to which she has been accustomed in her normal environment. It would be a mistake, for example, for a woman who had been previously fed on a simple diet of meat, potatoes and coarse bread, to be changed suddenly to a diet consisting largely of unaccustomed delicacies. It would be absurd to expect her to secrete milk normally under such conditions. The view that certain foods ingested by the mother derange the quality of the milk is probably fallacious. For instance, it has been shown experimentally, after feeding a wetnurse a large quantity of fat, such as bacon or cream, that the fat content of the milk remained unchanged. It was not the milk but the wetnurse herself that increased in fat.

At the Sarah Morris Children's Hospital, the wetnurse receives an abundance of good, wholesome food taken at the regular meal times. In addition, she receives a glass of milk every four hours of the day and night. The following is the menu used in feeding the wetnurses:

8 a. m., cereal, fruit, milk, rolls, cocoa or tea and eggs.

12 m., soup, meat, potato and one green vegetable, cereal, pudding or ice cream, and occasionally cookies.

6 p. m., meat, vegetable, cereal, stewed fruit and tea or milk.

Fruit forms an important part of the diet. Raw fruit is permitted, though stewed fruit is usually preferred. The fruit counteracts the tendency to constipation and avoids the necessity for laxatives. The nurse is encouraged to drink an abundance of water.

Particular attention is paid to the hygiene of the apartments occupied by the wetnurses and their babies. The rooms are kept scrupulously clean; overheating is avoided and proper ventilation is controlled. The personal hygiene of the wetnurses is carefully supervised. It is insisted that they shall bathe regularly and that they shall be attired at all times in clean clothes. Aprons or dresses made of washable material are worn, designed so that the breast may be easily exposed without causing undue pressure. As it would be difficult for the hospital to keep on hand a supply of clothes which would be properly fitting to all, each wetnurse provides herself with cotton dresses, which in most instances consist of light bungalow aprons which open in front on one or both sides.

The wetnurse is given ample time to sleep. She retires at 9 p. m. and rises at 8 a. m. She arises late because it is necessary to disturb her during the night in order to obtain the milk. Her own baby sleeps in the apartment with her, though in a separate bed. We do not permit her to nurse her baby at night. If the baby requires food in addition to that supplied by the breast, artificial feeding is provided for.

Each wetnurse is given some leisure in the afternoon between the milking periods. During this time she may exercise or rest. She is required, however, to return to the hospital promptly at the hour at which the milking is done. If she goes out for a walk, she takes her baby with her; this precaution helps to keep her out of mischief. She is not allowed to leave the institution after dark, and is required to be in her room by 8 p. m. On the whole, the mother is usually well satisfied with her situation. She has her own baby with her and is learning to care for it properly. This increases the interest in her work and undoubtedly renders it less irksome.

It was formerly considered that the appearance of menstruation was a signal to wean the baby; but our experience in this regard accords with that which is commonly stated, namely, that menstruation has little effect on lactation and none on the permanent quality of the milk. During the first day or two the baby may show a temporary disturbance; it may be restless, refuse the food, or show signs of mild dyspepsia, with vomiting and diarrhea. Statistics show that 50 per cent. of women are amenorrheic, 43 per cent. menstruate, and of these 20 per cent. have regular periods during lactation. In a word, then, many women menstruate during lactation without producing any permanent deterioration of the milk or any serious symptoms on the part of the baby.

The duration of lactation may continue for a long time, particularly if the stimulation to the breasts is maintained. As a rule, however, the milk tends to deteriorate toward the end of the first year, so that wetnurses usually are not retained after they have been with us for nine or ten months. At one time a wetnurse remained with us for eighteen months. The quantity and the quality of the milk were so exceptionally good that we hesitated to part with her at the end of the customary period. At the present time, one of the wetnurses at the hospital has been in service for eight months, and her supply shows no sign of diminishing. She produces as high as 56 ounces in twenty-four hours, in addition to that which she gives her own baby. The average daily amount which we obtain from each wetnurse, excluding that which she gives to her own baby, is about 37 ounces.

The accompanying tables indicate the daily quantity of milk expressed by the wetnurses which is available for use.

TABLE 3.—DAILY QUANTITY OF MILK EXPRESSED BY WETNURSE B. R.*

Day of Mo.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April
	oz.	oz.	oz.	oz.	oz.	oz.	oz.
1	31½	41	42	42	47	40½	39
2	39	43½	40	40	40	39½	40½
3	39	40⅝	42	41	40	41	41½
4	36½	41	43	40	44½	39½	39
5	37	43½	40	42	..	39½	39
6	37	39	47	44	28½	41	39
7	46	42	50	49	38	39½	41½
8	44½	42	44	44	37½	39	39
9	41	42	45	44	37	40	39
10	41	40	45	40	39	39	39
11	42	37	40	41	36	39½	39
12	47½	41½	39	43	40½	39½	39
13	41	40	44	40	40	39½	39
14	47	40	40	49	40½	40½	42½
15	40	40	38	51	..	39½	39
16	48½	39	38	40	42	39½	39
17	43	41	43	41½	43⅜	39	39
18	39	42	41	42	44	39	49½
19	39½	46	45	39	47½	39	39½
20	41	42½	39	41½	39½	41	39
21	46	41	43	40	43½	39	40½
22	39	41	38	37	43½	39	39
23	47	43	39	36	43½	39½	38½
24	41	41	38	42½	42	39	39
25	43	43	39	38	39½	39	41
26	43	41	43½	37½	41½	40	39
27	45	44	41	38	44	38	46
28	44½	42	40	39	40½	39	47½
29	45½	43	39	39	..	39	49½
30	45	43	39	40½	..	45	47
31	41	..	40½	40½	..	39	
Totals	1,301	1,245.7	1,285	1,282	1,063	1,230	1,227
	(40.67 qt.)	(38.9 qt.)	(40.16 qt.)	(40.06 qt.)	(33.2 qt.)	(38.4 qt.)	(38.3 qt.)

* Total amount for seven months, 270.2 quarts; average daily amount, 41.1 ounces; largest daily output, 51 ounces; previous occupation, housemaid; primipara; unmarried.

Civilization.—The prevalence of avoidable misery, and the direct encouragement afforded by society to all kinds of morally unworthy activities, are such prominent features of every modern community, that only a very strained use of the word "civilization" would make it truly applicable to such communities.—*Scientific American.*

PROBLEMS CONNECTED WITH THE COLLECTION AND PRODUCTION OF HUMAN MILK*

B. RAYMOND HOOBLER, M.D.
DETROIT

The failure of many mothers to secrete a sufficient quantity of milk to nourish their babies has been the subject of much discussion. Little has been written on the ability of many mothers to produce milk far in excess of the need of their offspring. This ability to produce an excess quantity lays on us the responsibility for its utilization, especially in view of the fact that many infants would thrive much better if at least a portion of their food could be supplied by human milk.

In our country it is estimated that 2,500,000 babies are born yearly, and with each birth there is the potential mechanism for supplying the necessary nourishment during the first nine months or a year. We have here not only a great life-giving provision, but also one of great economic importance. It is reported by Lucas, in his recent work in Belgium, that he found that many more mothers were nursing their babies during the past three years than previously. It is also recalled that during the siege of Paris, it was reported that maternal nursing was the rule; hence under the stress of great economic necessity, such as insufficient or improper food for feeding their babies artificially, mothers have found their breasts adequate to the demand. We earnestly hope that no such economic situation in our country will be necessary to force our profession and our mothers to an appreciation of the great waste which is permitted, when a breast which can produce should be permitted to dry up, or when one which has the possibilities of abundant production is permitted to produce milk only for the mother's own offspring. It has always seemed to me that, taking into consideration the breasts that fail or perform their function inadequately, and those that produce normally or abundantly, if some system could be evolved, simple in its application, whereby these mothers with abundance could supplement those who have a scant supply, it would be a great factor in reducing infant mortality as well as preventing a great economic waste.

For hundreds of years the accepted medium for performing this service has been the wetnurse, this wetnurse in the early times being a good samaritan neighbor or friend, who out of pity and from her abundant supply, suckled a motherless babe. Later, the professional wetnurse came into being, who for purely monetary reasons was willing to allow another baby to nurse at her breasts. Wetnursing has always been an uncrowded profession, though one which offered unusual financial remuneration. This is so, no doubt, owing to the inborn modesty surrounding motherhood; and far be it from me to wish it to be otherwise. There seems to be as much hesitancy on the part of a mother to permit her babe to nurse at another's breast as there is on the part of the mother to permit another babe to nurse her breast.

The attempt of our profession to depend only on the wetnurse as a medium of this exchange has, I believe, greatly retarded the more general use of mother's milk as a part of the diet of infants who do badly on artificial feeding. Often the home is not equipped to care for the wetnurse and her baby; often the home cannot afford the additional expense; many times the baby needs only a small amount of mother's milk daily; if the wetnurse is taken into the home she frequently disrupts the entire household. I believe there is a far better way of handling the situation. It does away entirely with the home difficulties and solves in a measure the economic problem.

Some years ago I conducted an investigation to determine whether or not mother's milk could be purchased on a purely commercial basis. Through the active cooperation of the social service department of Bellevue Hospital it was proved that such a thing was possible, and at the close of the investigation as much as 1,000 ounces per month was being purchased by Bellevue Hospital.[1]

COLLECTION AND DISTRIBUTION OF MOTHER'S MILK

I wish to describe briefly a method which I believe could be made available in every city or town which is equipped with a hospital, be it small or large. If several hospitals exist in a community the hospital conducting the largest obstetric service would be the hospital of choice for the establishment of a collection and distributing center.

In Detroit, in connection with the Woman's Hospital and Infants' Home, we believe we have an ideal place for conducting this work, having collected and distributed over 23,000 ounces of mother's milk in the last six months. It is important to have the milking of the breasts done under the supervision of a trained nurse. While in our work we have not detected any mothers attempting to make substitution or to water their milk, because of this careful supervision, yet it is related how a bottle of milk which was brought in, or milked without proper supervision, turned sour within an hour. If the milking had been done under the eye of a competent nurse, such an occurrence would have been impossible.

The hospital admits to its service, in addition to a large number of private obstetric patients, a number of young unmarried pregnant women who for a small fee are delivered and cared for during a period of three months following delivery. These girls are taught to take care of their own babies, and in addition perform light service about the home. It is the aim that every mother shall nurse her own baby. If she has more than sufficient milk, it is expressed and fed to babies of mothers who do not have sufficient. From among these mothers many are found who produce much more than is necessary for their babies, and this forms the basis of an excess quantity of human milk which is available for use outside of the hospital. All mothers are carefully tested as to their physical condition, Wassermann reactions are taken, and all expressing of breasts is done under the eye of a trained nurse who teaches the mother the technic of expression. The milk is collected in sterile bottles, measured, credited to the account of the mother, and then put in a refrigerator. During the period of stay in the hospital, the mother accumulates a neat sum to help her when she must go out into the world with two to support, and at the same time has been taught the value

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Hoobler, B. R.: Experiment in Collection of Human Milk for Hospital and Dispensary Uses, Arch. Pediat., 1914, **31**, 171.

of her breast product and has lost the hesitancy of supplying it for other babies.

Through the active manipulation of the breasts, done as a rule every four hours, the breast secretes an increasing quantity of milk; and at the end of the three month period, if the mother has developed a good milk-producing capacity, that is, from 16 to 24 ounces above the amount necessary for her own baby, she is urged to continue in the hospital as a producing mother; or if she has suitable home surroundings in the city, she is urged to continue milk production as a means of earning her living, in which case she returns to the hospital two or three times daily for expressing her milk. In this way many mothers are able to support themselves and their babies until such time as they regain confidence, or their homes are again thoroughly established. Other nursing mothers not connected with the hospital are appealed to by advertisement in the daily press and by placards in dispensaries, in several languages, stating that mothers who have an excess of milk may find remunerative employment, while remaining at home, by applying at the distributing center.

These mothers are visited in their homes; and if the homes are found suitable and their physical examination and Wassermann test are negative, they are placed on the list as contributing mothers; they come to the hospital twice daily and have their breasts expressed; the milk supply is well maintained by two expressions, particularly if the breasts are suckled between times. The babies of the mothers are examined and weighed regularly. The homes of the outliving producing mothers are inspected regularly as to cleanliness and infections. The work of distribution is as important as that of collection. The milk collected was distributed in the following ways:

A portion of this milk was used to feed the babies in the hospitals whose mothers temporarily did not supply sufficient for them.

A large proportion was supplied to homes on orders of physicians, to whom it was sold at a price varying from 10 to 25 cents per ounce. Some was supplied without any cost to families who could not afford to pay for it. An advertising campaign was carried on through medical organizations to interest physicians in the use of mother's milk. No advertising was sent out except to physicians.

The residue left after supplying the private demand was sent to the Children's Hospital and hospitals having children's wards that were under contract to take all excess milk at a flat rate of 10 cents per ounce. Thus none was ever wasted.

The milk is sent for regularly by the families using it. Occasionally delivery is made by special messenger. Milk is never delivered to a house by the mother direct. Usually two distributions are made daily, at 9 a. m. and 6 p. m. The distributing center is always open, and milk may be obtained at any hour, day or night, the night superintendent of the ward acting as custodian during the night.

Under suitable circumstances, mothers are sent into the homes with their babies as occasion requires. If this is done, a negative Wassermann test must be obtained on the receiving baby, or in lieu of this, a statement from two physicians that the baby is free from disease; and a release of responsibility for possible infection of the wetnurse is signed by the parent of the baby receiving milk direct from the breast of the wetnurse. Occasionally a mother continues to live at the hospital or in her own home, and spends the day at the home nursing the baby direct on the breast and expressing sufficient milk during the day so that the baby may be fed from the bottle at night. Every possible contingency is met by this versatile manner of conducting the bureau.

The organization necessary to carry out such a center may be very simple.

In a small hospital, a joint committee from the board of trustees and members of the hospital staff might be the functioning organization. In larger cities a joint board of pediatricians and social workers might cooperate in the establishment of such a center. There should be a paid social worker in charge if the work grows to any proportions.

The necessary qualifications for a producing mother are that she be healthy, with a double negative Wassermann test. Her own baby should be making average daily gains. Her home should be tidy and her personal habits clean. Analysis of her milk should occasionally be made. The period of her production may be prolonged to fifteen or eighteen months, Holt, Courtney and Fales[2] having shown that the average milk production between the ninth and eighteenth months varied very little from that produced between the sixth and ninth month. The milk of several mothers may be mixed, or milk from individual mothers may be supplied if requested by the attending physician.

A word from the standpoint of the pediatrician enjoying the privileges of such a human milk supply: During the past winter I have had occasion constantly to make use of this supply. I have found that it was often far more satisfactory to have the milk brought from the hospital than for a wetnurse to live in the home. I seldom fed the entire day's feeding in mother's milk, although in some cases this seemed necessary, particularly in premature infants who did not consume large quantities. It has been my experience that babies receiving mother's milk from the bottle did as well as those being fed directly from the breast. By bringing only the milk into the nursery, rather than the wetnurse, it seemed to me that the chances of introducing infections were lessened.

DIET OF THE MOTHERS

An important factor in keping the milk production of these mothers to the maximum is diet. From the fact that these mothers remain in the hospital for a period of three months after delivery on a diet prescribed by the hospital, it is of great importance to outline a satisfactory diet for them. Many young mothers fail during the first two or three weeks.

This was brought forcibly to my attention in the infants' service of the Woman's Hospital, where opportunity was given for accurate weighings to determine the amount of milk produced by each mother; it was not uncommon to find a mother giving her baby as little as 10 ounces daily at the end of three weeks, with the result that the baby's weight was at a standstill, necessitating temporarily the giving of supplementary feedings.

A study of the diet and regimen of these mothers was undertaken, and it was found that with some modifications of the diet nearly all the mothers were

2. L. E. Holt, A. M. Courtney and H. L. Fales (Am. Jour. Dis. Child., October, 1915, p. 238), speaking of milk produced during the tenth to twentieth month of lactation, say: "As a group the milks for this period show no constant or essential differences in any of their constituents from those of the mature period" (first to ninth month).

able to supply all the milk necessary to keep their babies gaining the usual weekly amount.

In a large service such as is maintained at the Woman's Hospital where the mother remains for such long periods (three months or more after delivery), the problem of supplying a diet suitable for maintenance of the mother and production of sufficient milk to nourish the baby satisfactorily is one of considerable economic importance, particularly at this time. A study of the literature on this subject revealed what seemed to me to be a very inadequate fundamental knowledge regarding the quantity and kind of food—particularly protein food—best suited to the production of human milk. Studies such as are here described relating to the production of human milk have been carried on for some years past by the observers in animal husbandry, and a great amount of data on the proper feeding of cows for the maximum milk production has been obtained; such knowledge has become the common property of all dairymen. It seemed, therefore, that a series of observations attempting to determine some fundamental principles involved in the production of milk in the human species might be undertaken.

The literature on the subject as it relates to human beings is exceedingly scant, but several careful pieces of research have been conducted on other species producing milk; the cow, the goat, the dog, for example, have been studied and a careful analysis made of the intake, excretion and retention, establishing for these animals certain facts which may generally be considered as true for the human being. E. B. Hart and G. C. Humphrey, working with cows, have added the most recent contribution to our information. They have shown that for cows not only the quantity, but also the biologic quality of protein has a marked effect on the milk production. Proceeding somewhat along the same lines they followed in obtaining their results, we observed several mothers over a period of three months using diets with varying quantities and kind of protein in connection with suitable fats and carbohydrates, and estimated accurately the nitrogen food intake, and the nitrogen excretion in the urine, feces and milk; also careful analyses of the fat, solids and caloric value were made and the quantity of milk was determined. The fluid intake and weight of the mothers was kept. The milk was expressed by the hand method and accurately measured. Each baby was fed on its own mother's milk given in a bottle, and the babies gained considerably in weight. The mothers were ideal for observation, accepting the diets willingly and cooperating in every way. At no time during the observation did anything occur to disturb the even tenor of their ways.

We elaborated several diets which, according to the most recent analysis, were estimated to contain protein to fat and carbohydrate in the ratio of 1:4, gradually widening this ratio until protein was to fat and carbohydrate as 1 : 15. These diets varied also in the number of calories fed in twenty-four hours and also in the biologic type of protein which was supplied. Certain diets were rich in meat protein; others in milk, cereal or nut protein. With these diets as a basis, we studied the milk production on each diet over periods of from four to seven days. Each mother was given identically the same food (all of the food was carefully weighed), but the quantity of water differed, each mother being allowed as much water as she desired.

The results as relate particularly to the nitrogen intake and output were reported at a recent meeting of the American Pediatric Society. This paper concerns itself particularly with the quantity and caloric value of the milk produced on these diets with especial reference to the biologic character of the protein best suited for human milk production.

TABLE 1.—DETAILS OF PRODUCTION

Diet	Ratio Protein Fat and Carbohydrate	Ratio Fat and Carbohydrate	Calories Fed	Milk Produced, C.c.	Calories	Protein in Milk, per Cent.	Fat in Milk, per Cent.	Total Solids, per Cent.	Sp. Gr. of Milk	Nitrogen Efficiency, per Cent.	Food Calories in Milk, per Cent.	Source of Protein in Diet, per Cent.
9	1:4	1:1	2,927	1,522	908	0.92	3.0	11.60	1.030	48.5	33	Meat, 40.5; cereal, 21.2; milk, 15.7; vegetable, 12.1; eggs, 10.5; hypophosphites
9	1:4	1:1	2,927	1,630	1,192	1.01	3.0	13.1	1.029	49.6	40	Same as above
7	1:5	1:1	2,842	1,486	962	0.89	3.0	11.80	1.029	13.9	33	Same as above exeept that malt extract was given instead of hypophosphites
7	1:5	1:1	2,842	1,751	967	1.06	3.0	12.0	1.030	26.4	34	Same as next above
10	1:5	1:1	2,670	1,758	1,096	0.97	3.6	11.80	1.027	5.3	41	Pure vegetable diet; nuts, 66.2; vegetables, 17.7; cereals, 14.8; fruits, 1.35
10	1:5	1:1	2,670	1,620	1,372	1.09	3.6	16.50	1.027	13.8	50	Same as above
1	1:6	3:2	3,767	1,475	1,042	0.83	3.9	13.10	1.029	38.8	27	Milk, 33.5; cereals, 33.55; meat, 21.5; vegetables, 11.5
1	1:6	3:2	3,767	1 445	1,071	1.18	3.0	16.00	1.029	43.0	28	Same as above
6	1:6	1:1	2,774	1,329	1,000	0.79	2.4	9.50	1.028	—3.0	35	Meat, 40; cereals, 21; milk, 15.7; vegetables, 12.1; eggs, 10.5
6	1:6	1:1	2,774	1,521	1,269	1.01	2.7	12.30	1.029	+2.3	45	Same as above
2	1:8	2:3	3,446	1,425	835	0.97	3.0	11.60	1.030	—1.4	24	Meat, 27.7; vegetables, 19.8; cereals, 18.1; milk, 14.5; nuts, 9.4; eggs, 8.5
2	1:8	2:3	3,446	1,375	668	1.04	3.4	10.00	1,028	+20.7	20	Same as above
3	1:9	1:4	3,503	1,370	824	0.84	3.3	11.10	1.029	11.1	23	Pure vegetable, exc. milk; cereal, 60.5; milk, 23.9; vegetables, 14.2; fruits, 1.4
3	1:9	1:4	3,503	1,174	706	1.02	3.9	12.00	1.030	22.0	21	Same as above
5	1:9	1:1	2,088	1,475	1,014	0.89	3.3	13.00	1.029	—104.0	48	Meat, 32.9; vegetables, 19.8; milk, 19.6; cereal, 14.8; eggs, 12.9
5	1:9	1:1	2,088	1,536	945	1.07	3.0	11.00	1,030	—70.5	45	Same as above
8	1:13	1:4	2,286	1,507	786	0.90	3.6	11.50	1.029	—8.6	34	Pure vegetable diet; cereal, 54.2; vegetable, 40.3; fruits, 5.5
8	1:13	1:4	2,286	1,586	973	0.98	3.6	12.8	1.030	—102.8	42	Same as above
4	1:15	2:1	3,634	1,362	970	0.89	3.6	13.1	1.028	—2.2	27	Milk, 37.1; cereal, 28.2; vegetable, 18 6; meat, 10.5; nuts, 5.6
4	1:15	2:1	3,634	1,416	1,059	1.04	3.9	13.5	1,030	—30.2	29	Same as above

That there is a biologic difference in the various proteins in their effect on growth has been shown by many observers, particularly by Osborn and Mendel[3] and most recently by McCollum.[4] That the same principles involved in growth might also obtain in milk production in cows was suggested by Hart and Humphrey,[5] who have reported several admirable pieces of work which show conclusively that the biologic character of the proteins, as well as their quantity, has a marked effect on the milk protein production in cows. Observations on nursing mothers as similar as possible to those made on dairy cows were carried on, and in instances in which conditions could be approximated, the findings were in general the same as found by Hart and Humphrey.

The details of production are set forth in Table 1, and from these findings it is possible to estimate which proteins or groups of proteins were most efficient in milk production in the mothers observed. In attempting to determine the efficiency of any diet fed, factors which must be considered are: (1) quantity of the milk produced; (2) caloric value of the milk produced, and (3) loss or gain of tissue of the mother producing the milk.

In Table 1 are submitted the details of the observations which cover these points. From the standpoint of quantity of milk, Diet 10, made up of nut protein supplemented by vegetable protein only, produced an average of 1,234 calories, over a hundred calories above any other diet; also an average of 1.689 c.c. of milk in twenty-four hours. From the standpoint of protection of maternal tissues, one of the mothers showed a nitrogen efficiency of 5.3 per cent, and the other of 13.8 per cent. Thus in the three essential standards Diet 10 produced the best results. It is not intended to convey the impression that this diet would always accomplish the same good results, for while it produced the same general results in each of the mothers under observation, a much wider application of such a diet must be undertaken before a definite decision can be reached; but such were the findings in this observation, and it is for those interested to test it clinically.

The actual ingredients of the diet are given in Table 2. The diet contained approximately 2,670 calories. The ratio of protein to fat and carbohydrate (all reduced to basis of calories) was 1:5. The actual

TABLE 2.—INGREDIENTS OF DIET 10 (NUT DIET)

	Gm.		Gm.
Malted nuts	100	Chocolate	8
Protose (nut product)	150	Bread	200
Pecans	25	Potatoes	200
Almonds	25	Lima beans	100
Walnuts	25	Peas	200
Peanut butter	50	Bananas	100
Cocoa	8	Apple sauce	50

grams of protein ingested was 104.68, yielding 16.75 gm. of nitrogen. Of this intake 89 per cent. was absorbed. The mothers took the diet readily, and in fact enjoyed it.

This diet demonstrates that the biologic character of vegetable protein, particularly if composed largely of nut protein, is not incompatible with a production of milk protein whose biologic character is entirely different.

This does not hold true when a pure vegetable diet, such as Diet 8 from cereals, vegetables and fruits, is given. This may be suitable for building into human milk protein, but it is exceedingly difficult to feed a sufficient amount of protein in such a diet, although the insufficiency of these proteins for milk protein production was concealed by the mothers by their ability to metabolize their own tissue proteins and maintain secretion at a high level.

On a diet composed of corn and gelatin, both of which are deficient in certain of the amino-acids, the quantity, but not the quality of the milk production

TABLE 3.—INGREDIENTS OF DIET 9

	Gm.		Gm.
Oatmeal	150	Rice custard	100
Bread	200	Cocoa	4
Butter	25	Apple sauce	50
Round steak	150	Lima beans	100
Eggs	100	Sugar	50
Potatoes	200	Cream 20 per cent.	100
Milk	500	Spinach, squash or carrots	100

* A compound syrup of hypophosphites, ½ ounce, three times a day was given before meals.

was maintained. This diet, however, was accompanied by marked negative nitrogen balances, thus demonstrating the ability of the human being to compensate at least temporarily for the deficiencies in the biologic structure of the proteins fed.

Thus we may well conclude that the protein in a pure vegetable diet (not including nut diet) is both insufficient and inefficient for the maximum production of milk protein.

With the exception of the nut protein diet, the other biologic forms of protein best adapted to milk production were derived from animal protein, and consisted of a mixture of meat, milk and egg protein, with an added quantity of cereal and vegetable protein composing about one third of the available protein. This diet showed high efficiency from the standpoint of quantity, calories and maternal protection. The total quantity of milk was 1,576 c.c., calories produced 1,130, and both mothers remained in positive nitrogen balance. The diet is given in Table 3. It approximated 2,927 calories. It contained 130 gm. of protein yielding 20.64 gm. of nitrogen. The sources of the protein were: meat, 40.5 per cent.; milk, 15.7 per cent.; eggs, 10.5 per cent.; cereal, 21.2 per cent.; vegetables, 12.1 per cent.

As to the question of which of the biologic forms of animal protein is best suited to milk production, it would appear that milk protein has a particularly high value in this regard, as demonstrated in Diet 3. In a diet of a rather wide ratio, 1:9, milk protein was the only form of animal protein fed, and constituted 23.9 per cent. of all protein fed. Yet this quantity of animal protein was able to convert what would otherwise have been a marked negative balance into one with a positive nitrogen efficiency of 17 per cent. In another instance, a diet containing a small amount of milk protein with a nitrogen efficiency of 47 per cent. was increased to a nitrogen efficiency of 74 per cent. by the addition of 250 c.c. of milk.

Other factors, such as total number of calories, the proportion of protein to other ingredients, and also ratio of fat to carbohydrates are important.

The number of calories fed in the diets used varied from 3,764 to 2,088. Four of these diets varied from 3,400 to 3,700. The average amount of milk produced daily on these diets was 1,380, with an average of 1,033 calories in the milk. Four of the diets varied

3. Osborn and Mendel: Bull. 156, Pub. Carnegie Inst. Washington, 1911.

4. McCollum, E. V.: The Supplementary Dietary Relationships Among Our Natural Foodstuffs, The Journal A. M. A., May 12, 1917, p. 1379.

5. Hart, E. B., and Humphrey, G. C.: Jour. Biol. Chem., 1915, **21**; 1916, **26**, 457.

from 2,600 to 2,900 calories. The average milk production in twenty-four hours on these diets was 1,576 c.c., with an average caloric value of 1,103 calories in twenty-four hours. The mothers were more frequently in nitrogen balance on the diets varying from 2,600 to 2,900 calories than when fed diets varying from 3,400 to 3,700. In two of the diets, calories varied from 2,088 to 2,286. On the average, the amount of milk produced in twenty-four hours was 1,501 c.c., but in caloric value it was decidedly below the average, being but 929. The mothers were in constant negative nitrogen balance. These low caloric diets were constructed to approximate diet lists obtained from several nursing mothers whose milk supply, while fairly abundant, did not satisfy the needs of their babies. It is evident that even though on a low caloric diet the quantity may be maintained, yet the quality of the milk must of necessity deteriorate as the reserve of the mother is used up. It seems to me that this is one of the frequent causes of failure of supply. In order to consume 2,600 calories in twenty-four hours a mother must devote herself to the task, while the consumption of from 2,000 to 2,200 may be easily accomplished on her part. I am convinced that the diet of the first three or four weeks of the puerperium is based too much on what might be called sick room specialties, broths, gruels and titbits of one kind or another which are not sufficient to support an increasing production of milk.

It seems to me rather that the mother should be considered as a normal individual whose diet must include sufficient for two. The fear of carrying over in the puerperium an ante partum albuminuria deters many mothers from eating as freely of a mixed diet as they should. It is true that the maternal tissue will give up of its protein and its fat and glycogen to supply the constituents, but when these are depleted it cannot be continued indefinitely, and the diet must be commensurate with the need. The proportion which the protein of the diet bears to the fat and carbohydrate of the diet also has much significance. It varied in the diets used from a ratio of 1:4 to one of 1:15. These ratios refer to the proportion of digestible protein to digestible carbohydrate and fat, the latter reduced to a carbohydrate basis.

The diets accounted the most efficient were based on a narrow nutritive ration of 1:6 or narrower. It is difficult to feed a diet containing a wide nutritive ratio, for example, 1:15, without either feeding too little actual protein or, if the protein requirement be maintained, overfeeding with fat and carbohydrate. The protein proportion of the diet is best supplied by animal protein and least satisfactorily by vegetable protein with the exception of nut protein, which seems in every way as suitable for elaborating milk protein as does animal protein. There seems to be considerable evidence that at least a certain amount of milk protein is an important ingredient of the efficient diet. In general, one may state that a generous mixed diet, including nuts, milk, meat, eggs, with cereals, vegetables and fruits constitutes a diet containing the potential factors for the maximum milk production.

SUMMARY

1. A diet to be efficient must produce a sufficient quantity of milk, containing nutrition adequate to cause an increase in growth of offspring without impairing the tissues of the mother.

2. Diets containing from 2,600 to 2,900 calories in twenty-four hours produced better results than diets containing from 3,400 to 3,700 calories. It is of no avail to overfeed in hope of maintaining or increasing the milk supply.

3. Diets containing 2,000 calories or less cannot protect maternal tissues and at the same time produce sufficient milk. A nutritive ration of less than 1:6 gave best results.

4. Animal protein is better than vegetable protein for purposes of milk production.

5. Nut protein is as efficient as animal protein in elaboration of milk.

6. The best form of animal protein to protect maternal tissue and increase milk production is cow's milk protein.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SEDGWICK, ABT AND HOOBLER

DR. FRITZ B. TALBOT, Boston: Too much attention cannot be given to this subject, because until recent years there have been few hospitals that have had enough wetnurses for their babies. I believe every hospital with an infant's ward should have at least two wetnurses. I want to emphasize again what Dr. Abt said about watching wetnurses when they are expressing the milk. There should be some responsible person in the room at the time. In the directory for wetnurses of the Infants' Hospital, Boston, cow's milk and water have been added to bring up the amount of milk.

Our technic is the same as Dr. Abt's, except that the milk is strained through sterile gauze before being put in the bottle. After it is put in the bottle a stopper of sterile cotton is put in, and the stopper is sealed with wax. If there is any tampering with the bottle the wax will be broken. This is merely a safeguard.

I want to draw attention to something that impressed me in Schlossmann's clinic in Dusseldorf. When Schlossmann has more human milk than is needed, he freezes it and puts it in vessels where it is kept in a frozen condition until it is ready to be used. He says that it gives no untoward symptoms when it is melted, and its use has proved satisfactory.

There is often a great mistake made by the practicing physician in considering that breast milk is not good when the wetnurse's baby is over a year old. I want to emphasize what Dr. Abt said about continuing to use a wetnurse even if the baby is over a year old, because other babies do perfectly well on her milk, even up to eighteen months. In other countries, Japan in particular, women often nurse their children for three or four years. One important phase of the wetnurse problem is the social side of it. It is important to keep the baby with the mother, in order that the baby may have a fair opportunity to live. When separated from the mother, the child's chance for life is not very good, whereas of those kept with the mother at least 95 per cent. will live and thrive. Aside from the social element, the mother always secretes more breast milk when she has her baby with her, because she is happy. This is an important reason for keeping the baby of the wetnurse with her.

I should not like to have this discussion close without some one saying that every wetnurse should be examined for tuberculosis, and any other contagious disease ruled out. I am sure that every one present does that, but we want at least to say it in the discussion.

DR. LEWIS M. SILVER, New York: Regarding the age of the period of wetnursing, a cousin last summer took a trip through the Hudson Bay country, and when he returned he showed a picture of a Labrador woman nursing a baby of 4 years. He said that was a common occurrence up there. They nurse their babies sometimes up to 5 years.

DR. JACOB SOBEL, New York: My interest in the wetnurse problem is rather from the community standpoint. Being in charge of the baby welfare work of New York, and in control of fifty-nine baby health stations, I am interested in anything which makes for the reduction of infant mortality. We have met many obstacles in securing wetnurses for the people

who make demands on us. The result is that we have been compelled to resort to certain measures from a municipal standpoint, which, if applied to other communities, might result in increasing the number of wetnurses available. Our procedure is this: With the number of yearly births in New York 137,000, and some 40 per cent. of birth registration in the control of midwives, it becomes necessary that the midwives report every case of stillbirth. Immediately on notification, we visit the home of the mother who has given birth to a stillborn infant, and after examination, of course, ask her whether she would be willing to wetnurse an infant. In this way we have been able to establish a directory at the health department and to have a larger number of wetnurses available than ever before. The bureau of records, on receipt of notification that an infant under 1 year of age has died, communicates with the mother and makes a similar request. With these two methods of procedure we find that the monopoly of wetnursing in New York City is rapidly disappearing. I think a procedure of that kind if applied to other communities would increase the available number of wetnurses.

In New York City there is a neighborly feeling, which may not appear so evident to people who come from out of town; but among Italian and Jewish people it is not at all uncommon for a neighbor who has a large supply of breast milk, to be perfectly willing to give part of it to a neighbor's youngster who is suffering from one of a large number of conditions such as Dr. Abt brought out.

The question of maternal nursing is rather an important one from the baby health station point of view. We have been criticized, as have all baby health stations, as tending toward artificial feeding. I would like to say here that at the baby health stations of this city over 60 per cent. of the infants enrolled are exclusively breast fed, and some 19 to 20 per cent. more, partly on the breast and partly on the bottle; so that the efforts of the baby health stations are primarily educational, and they may endeavor always to encourage breast feeding.

We have had cases similar to those referred to by Dr. Sedgwick, in which mothers say they cannot nurse their babies. Sometimes they come to us after six or eight weeks and by insisting that the baby be applied to the breast, we have succeeded in numerous instances in materially increasing the supply.

I would like to ask whether any present have tried injection of breast milk subcutaneously as a galactogogue. We are trying it in a few cases—going about it very guardedly. While my experience is not sufficient to make any statement, I should welcome any information.

DR. L. E. CHAPPELLE, Grand Rapids, Mich.: I tried it once, with very encouraging results.

DR. JACOB SOBEL, New York: Dr. Chapin in his article on "Institution vs. Foster Mother Care" advocated "back to the home." I hope the contribution of this section to the mothers of the country will be "back to the breast."

DR. GEORGE DOW SCOTT, New York: Those of us who have been brought up in the hospitals of Europe and have studied pediatrics while in them, have noticed the great differences between the status of the wetnurse there and here. These conditions and differences were noticeable to me particularly in Vienna and Budapest, where the social status of the unmarried, impregnated woman—for a large part of these women are unmarried—aroused less observation and criticism. In the larger cities of this country, particularly in New York, Boston and Philadelphia, this criticism is less severe than in our smaller cities, and we therefore get better wetnurses.

DR. CHARLES HERRMANN, New York: There is one imporant point in the case of the wetnurse attached to the babies' ward. It is important to know just how much it costs.

DR. OWEN H. WILSON, Nashville, Tenn.: I have been using this method for over twenty years. I am glad to see expressed breast milk is coming into vogue. I find it easy enough to get a woman to go to a home twice a day. If enough cannot be secured from one, herd milk is just as good as individual. The wetnurses have to be watched, however. We have had them carry bottles of milk in their bosoms and empty them into the receptacle. I have used one wetnurse on twelve babies in one season. I have her stay with each baby three or four weeks until we get it on some other food.

Twenty years ago we did not have the Wassermann, and the methods of determining syphilis have much improved. I do not believe, however, that breast milk can convey syphilis. I do not believe the spirochete will live in drawn breast milk, especially if kept cold. Of course I examine patients now; but I was speaking of pre-Wassermann days.

DR. CHARLES L. SUMMERS, Winston-Salem, N. C.: In reference to the age of the wetnurse, in Vienna and Berlin, where I worked in 1911 and 1912, we had several wetnurses over a year nursing in whom the quality and quantity of the milk were both satisfactory. At present, in the Garret Hospital in Boston where I am serving, we have a wetnurse with a child 10 months old, and she is regularly giving 57 ounces of milk a day. There is one feature I wish to call attention to, and that is that the milk under these conditions is usually high in protein and low in fat, and for this reason its caloric value decreases. The quantity of milk under such circumstances has to be increased.

DR. CARL G. LEO-WOLF, Buffalo: These interesting papers belong in the section on obstetrics, but unfortunately obstetricians are not interested in these cases. They keep experimenting with them, and when they are finally turned over to us it is often too late. This subject belongs to the accoucheurs, but they do not know anything about it, and the probability is they do not wish to know.

DR. J. P. SEDGWICK, Minneapolis: I want to take exception to that. I think the babies belong to the pediatrist as soon as the cord is tied.

DR. FRANK S. CHURCHILL, Chicago: I want to ask Dr. Abt to tell us what the mortality in these babies' wards now is, compared with four or five years ago.

DR. E. J. HUENEKENS, Minneapolis: For the past two years I have been experimenting with breast milk that has been preserved; that is, heated for one hour at 56 C. with concentrated hydrogen peroxid. We have used this in the outpatient department of the Infant Welfare Society. Mothers collected the milk themselves and brought it to the station, where it was sterilized by the nurse. I have been able to preserve milk three weeks during the hot summer months, and keep it in very good condition. Bacteriologically, breast milk would contain, when it reached us, 300,000 to 1,000,000 bacteria per cubic centimeter. We were not able to sterilize the breast milk, but we were able to keep it at about the same level for three weeks. This preserved milk seems to be as good as the fresh milk so far as results go. The time that it takes for this procedure makes it impractical for an outpatient clinic, but I feel it would be practical in a combined obstetric and pediatric hospital, and during the coming year I intend to try this at the University of Minnesota Hospital.

DR. L. E. CHAPPELLE, Grand Rapids, Mich.: In Grand Rapids we pay $8 to $12 a week for a wetnurse.

DR. ARTHUR D. HOLMES, Detroit: Some three years ago we had difficulty in securing wetnurses, and decided to establish a bureau and furnish wetnurses in suitable cases. We placed notices in the local papers and with the members of the profession, asking women who had had stillbirths or lost their babies to register at our bureau, guaranteeing them $7 a week, board, room, and necessary laundry for themselves and child. We soon had quite a number, some of whom came only to have the milk expressed. Milk was sold at 20 cents an ounce and any oversupply was sold to the Babies' Hospital for 10 cents an ounce. By a careful supervision of the social service nurse the bureau has a balance in the treasury. The mothers were instructed, thoroughly examined, Wassermanized, and a guarantee was taken from the family in which the child was to be nursed, for the protection of the wetnurse.

DR. ISAAC A. ABT, Chicago: It is easier to employ a wetnurse in a hospital than in a private family, because in a hospital she is not hampered or worried. I think it is the experience of every one who knows anything of wetnursing in the home, that certain members of the family are apt to domineer and worry the nurse. The best policy is to leave her alone and to spare her all irritation.

Although I have had no experience with the injection of expressed milk as a galactogogue, I may say that I have tried almost every galactogogue and have never seen any beneficial effect from any of them. In my opinion, the only galactogogue is the stimulation of the breasts, and the best stimulant for the breast is the sucking of the baby.

I may say in regard to examining women for syphilis and tuberculosis, that I laid no stress on this phase of my subject because it is so elementary. We examine for syphilis and tuberculosis, of course, in every case. In any instance in which the Wassermann test has not been made, and we are in desperate need of milk, we boil the breast milk until the Wassermann test has proved it all right.

Replying to Dr. Wilson of Nashville, we must be extremely careful of the milk of unexamined women. Dr. W. T. Watson some four or five years ago read a paper in this section in which he gave an instance of one syphilitic nurse who had spread the disease among many institutional babies. It is probable that a specifically infected woman may convey infection through her milk if not through her breast.

We pay wetnurses $8 a week. We do not like to have any one pay them more, for it is the middle and lower class people, of no great means, who need them most. It is very rare, however, for a woman to receive more than $8 a week. In every instance of employment, her baby accompanies her.

In regard to the point about drawn breast milk being high in protein and low in fat and caloric values, I may say that as far as we are concerned the caloric value of the milk is of minor importance compared with its efficiency as a therapeutic agent. These babies are brought to the dispensary sick. We want to save them; we want to reduce the infant mortality; we want to make a record for our hospital. It makes no difference whether the milk is of high or low caloric value, it serves to bridge the baby over a very desperate period and saves its life—that is the point.

Dr. Churchill wanted to know about the specific mortality results. I cannot, at this moment, give specific results. I know this, that babies are brought in to us marantic, with cold extremities, on the very edge of the hereafter, and we give them a few teaspoonfuls of breast milk, and keep on giving it, and the babies revive. We do this day after day. I do not know what the mortality rate it, but I do know that without breast milk we would lose nearly every one of these desperately sick babies, and with it we are in a position to save most of them.

DR. THOMAS S. SOUTHWORTH, New York: Dr. Chapin, in a discussion of an earlier paper, spoke of doing away with the institution in favor of having the children cared for in the home. That may come, but personally I believe for the time being in doing what we can in the institution to improve it. The mothers who give birth to babies there should receive such diet that they will be able to nurse their babies. This is a question much neglected in nearly all lying-in institutions. There is great difficulty in getting a sufficient amount of cow's milk for these nursing mothers to enable them to produce milk. We should wake up to the fact that we are starving the breast fed babies as well as the artificially fed babies, because the mothers do not receive the proper diet.

DR. HENRY I. BOWDITCH, Boston: I want to accentuate Dr. Hoobler's paper and impress on the minds of all that it is an easy thing to produce a similar group of wetnurses. The Boston Floating Hospital was able to procure during the summer from mothers interested, breast milk at approximately 80 cents a quart. It is a possible thing to produce by the proper organization, backed up by tests of blood, etc.

DR. WILLIAM P. LUCAS, San Francisco: One of the most vital questions which any section can deal with, and one which probably every pediatrist neglects more than any other, is the question of infant feeding. We have a service which I am glad to see growing—a combination of pediatric and obstetric service. Infants are turned over to the pediatrist as soon as they are delivered. We have had opportunity to study the milk production as never before. It is interesting to note the inequality in the early production of milk. Not only the food has an influence, but the psychologic and mental condition of the mother has a bearing. I have studied that very closely, because in all the literature we find it just barely mentioned, that the mental or psychologic condition is a factor. I believe it is very important.

Take it in a ward where many mothers have illegitimate children. The home factor is very important in upsetting the milk supply. The social service department in relation with these mothers is very often able to correct these conditions; it can often do more good than the diet. If the mother is upset mentally, no matter what diet is given her, she will not have milk sufficient in quantity or quality.

As to the question of having a wetnurse directly, Dr. Hoobler very wisely said that he only advertised to the medical profession. It is rather a commentary that we should have to advertise to the medical fraternity. It is the most difficult thing to get medical men to take up the use of breast milk. We have attempted to have the same type of service that Dr. Hoobler has so successfully carried on. It takes a great deal of money to carry on an institution of that kind, but there is always on hand a sufficient amount of milk.

DR. HERMAN SCHWARZ, New York: I have been interested in the problem of securing and distributing breast milk for many years, and have been surprised that there was any great difficulty about it. I may say I have been fortunate in being connected with a combination obstetric and pediatric service (outpatient department).

We have about thirty breast fed babies coming to our outpatient department every day. We know these babies from long before they are born. We know the families—whether there have been any stillbirths or abortions. If such is the case a Wassermann test is made on the mother long before the baby arrives. Thus, it is perfectly easy to get 20 to 30 ounces of breast milk in an afternoon. In summer we pasteurize or sterilize this milk if we wish to keep it any length of time. If the mother brings it herself, we simply use the Umkoff reaction to be sure it is human milk. We use the milk simply as a therapeutic measure if we need it.

I do not think we should go away with the impression that it is good for the health of the woman to nurse for twelve or fifteen months. It is not fair to have her nurse so long. Considering the effect of diet on milk, I have come to the conclusion that as long as the mother is given a well-balanced diet, with her digestion in good shape, if she gets enough rest, very little can be done to alter the composition of her milk.

DR. LAWRENCE T. ROYSTER, Norfolk, Va.: The psychology of this condition, as has been mentioned, is very important. I want to bring out one thing along this line. Education plays such a very important part in the care of nursing babies, as well as artificially fed babies, that we should look to educational propaganda to accomplish something. There are two classes of people who need education—the mothers and the physicians; and in some cases the physicians need it more than the mothers. The mothers are being educated through popular articles. The bureau in Washington, over which Miss Julia Lathrop presides, is doing a wonderful work. The mothers are beginning to grasp the situation; they are demanding a more careful supervision of their babies. The mothers are educating the physicians—the general practitioner, I am talking about.

I should like to sound one note of warning: When the mothers are urged to nurse their babies from the standpoint of the babies' health, as well as for economic reasons, the importance of keeping track of that baby's weight is not emphasized sufficiently. Frequently mothers come to me with a baby which had weighed 8 or 9 pounds at birth, and at 3 or 4 months of age weighs less. As the milk declined in the mother, she became more frightened until she gave less and less milk. We know that the psychology has a great influence on the secretion of milk.

The popular magazine articles for mothers serve their purpose admirably if they are written by one who knows, and are properly censored. I recently saw an article in one of the most prominent magazines of the country, in a series of articles to the mothers about their babies, in which appeared a beautiful picture of that especial abomination, the white enamel spring scale, with a white basket on it, on which we all know there is no reliance to be placed, and in the basket was lying a beautifully dressed—completely dressed—baby.

This article was written by a woman who signed herself as a registered nurse. The sooner we get away from the ignorance of such a writer as that, and the appeal to the esthetic in the nursery, and come down to the common sense of a cheap, balanced scale and a nude baby, the sooner we will get results.

Dr. L. R. DeBuys, New Orleans: There is one factor which has not been sufficiently emphasized, namely, the use of the scales in connection with the nursing mother's weight. We are all familiar with the poor underfed mother who comes to the clinic who is trying to nurse her child. Frequently the baby thrives and gains satisfactorily at the expense of the mother, who is losing weight steadily. In these cases we are impressed with the importance of the mother receiving a sufficient amount of food, not only for her baby, but for herself as well if they both are to thrive. The use of scales for both should be employed in determining this.

Dr. Henry Heiman, New York: What Dr. Hoobler has told us is of great importance. It is well to remember that the salts of sodium, potassium and chlorin diminish gradually in mother's milk as lactation progresses, whereas calcium, magnesium and phosphorous salts remain fairly constant.

Regarding obtaining the milk, we sometimes find it extremely difficult, unless we instruct the nursing mother to express it properly. That is a matter about which people need instruction.

Dr. R. R. Ferguson, Chicago: Two interesting points have been brought out in the discussion of these papers. One is that the cost of the milk, unless used absolutely as a therapeutic agent, is entirely out of proportion to the status in life of most families who need this milk. According to one or two of the speakers, if the milk were used in pint quantities for several weeks it would be almost prohibitive. If used in quarts it runs up to $30 or $40 a week. These prices are prohibitive for the common run of people who most need it. One speaker said 80 cents a quart. It seems to me it is up to those of us who are studying this subject to see that the cost is reduced so that the people in moderate circumstances may be able to avail themselves of it.

As to the question of boiling the milk, it seems to me we should be at least as careful as in the use of cow's milk. The men who are collecting the milk and having a bacteria count of 100,000 should not be allowed to put such milk on the market, especially since it is mother's milk. Cleanliness in mother's milk is more important and more easily obtained than in cow's milk. Therefore, I urge on you the importance of keeping the bacteria count low enough so that you will not have to change the quality of the milk by boiling it.

Dr. T. C. McCleave, Oakland, Calif.: Much has been said about maintaining the mother in good psychologic condition. For a great many years I have been connected with high grade dairy work and I have learned there that every dairyman knows how more or less to alter the constituents of the cow's milk at will—that he can so feed the cows as to get the maximum output of high-grade milk. The point brought out by the charts shown by Dr. Hoobler is of greatest importance. Apparently, heretofore, so far as my knowledge goes, the chief item considered in the feeding of the nursing mother is to give her a large quantity of food, especially milk and other fluids. I have found in my experience that one of the most annoying things to the mother, and one which is complained of bitterly, is the everlasting having to eat. I have had mothers say that they simply could not stand any longer this continual feeding—that they were nauseated with food. I think Dr. Hoobler, in laying down the limits beyond which it is unnecessary to go in feeding mothers for milk production, has brought out an important phase of this situation, and one that I hope to apply to the mothers coming under my care. Certainly if we can keep mothers supplying the necessary amount of milk on a diet of 3,000 calories or less, we will relieve them of the distress of overfeeding, and of a disadvantageous phychologic condition.

Dr. Jacob Sobel, New York: I think Dr. Ferguson sounded the keynote, so far as public health work is concerned. The cost makes it prohibitive for the tenement house patients—those who need it most. Far be it from me to say that the wealthy should not have all that money can buy; but in my opinion the children of the wealthy do not need this milk as much as those of the poor, for the wealthy can buy so many other things that compensate; for instance, proper surroundings and good hygienic conditions, careful nursing, and other things which will be impossible for the tenement baby. The tenement child needs the best food obtainable, because it has to overcome the worst surroundings. We must devise some means by which the poor people will be able to secure a reasonable supply of pure breast milk.

I also want to corroborate the statement made by Dr. Royster as to the importance of the mother knowing the weight of the child. We know that the weight progress of the child is one of the most important indexes of its development, and if you will visit any of the baby health stations of the city—there are 59 of them—you will see the weight book which is given to the mother. If the weight of that child remains stationary or declines, it is recorded in red ink as a danger signal, calling attention to the fact that something is wrong.

Dr. Isaac W. Faison, Charlotte, N. C.: I should like to ask Dr. Hoobler the best means of expressing the breast milk. I live in a country where there is no such thing as securing milk to feed a baby—mother's milk. Therefore I must appeal to you men who live in the larger cities to study out and make plain an easy plan of artificial feeding. It has got to be improved. I live in a country where we do not, among the white race, have as many illegitimate children as in some communities. These cases are among the colored in our district—a race that cannot be depended on as wetnurses. In the desperate cases, what do I do? I go to the best women in our community and get the milk without money and without price, by just asking for it. They will give it if they can. That is the plan on which I have to work. And you people in the large cities, who have a large population to draw from, do not know the problems of the small town in that respect. We need some plan of artificial feeding which will replace mother's milk. Still I know in some cases artificial feeding will not answer.

The expression of the milk has been one of the things that has been a nightmare to me. If there is a good breastpump on earth, I should like to find it. If there is any plan by which we can feed these children outside of mother's milk, I should like to know it; and if there is any plan by which we can get the milk from the mother without worrying her to such a point that she cannot give enough for her own child, much less another's, I will be glad to know it.

Dr. Oliver Hill, Knoxville, Tenn.: I come from Knoxville, a town no larger than Dr. Faison's home, and wish to come to the defense of the Southern negro woman as a wetnurse. I have at present a negro wetnurse feeding five babies.

A negro girl who passes a satisfactory physical examination, and has a negative Wassermann, is eligible. These nurses go to the house and nurse the babies two or three times a day, or more if indicated, purely as a therapeutic measure, or for nutriment of the babies. They can be cultivated until they are efficient.

I really think we have an advantage over you gentlemen in the Northern cities, because the negroes will come for a small amount of money, if you do not overpay them, or pay them in advance. And if you keep them in good physical condition, they give milk of a good quality. I have one who nursed three babies all summer, a girl about 22 years old. She apparently gave plenty of milk for all three babies, with some supplementary feeding the latter part of the summer.

Dr. Bert R. Hoobler, Detroit: Just a word about the expense of the milk. In my paper I said we sold it at from 10 to 25 cents an ounce. I also said we gave a good deal away to those who could not afford to pay at all. The amount received from those who can pay helps to equalize the cost of that which we give away. We say 10 cents an ounce as a minimum, because that about equals the amount paid to a wetnurse if we put her into the home. Take $8 a week, and add to that the expense of the mother's food and other expenses, and it brings it up to about $15 a week. Any home that can afford to pay $15 a week can afford to pay 10 cents an ounce. In homes where there is more money, we get more, because they are willing to help pay for milk for those

who are less fortunate. Some persons become exceedingly interested in our bureau and have given freely and gladly to its support.

The technic of expression has been discussed by every one of the essayists and I am sure if Dr. Faison will interview any one of these men they will be glad to have a private conference with him.

ELECTROCARDIOGRAPHIC CHANGES ASSOCIATED WITH MYOCARDIAL INVOLVEMENT

WITH SPECIAL REFERENCE TO PROGNOSIS *

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Theoretical considerations have led us to investigate a certain type of electrocardiogram with a view to determining its relationship to myocardial involvement. We were struck by the fact that the electrocardiograms interpreted as due to bundle branch lesions in human beings differed considerably from those resulting from experimental bundle branch lesions in animals. Moreover, pathologically the occurrence of a lesion confined to either of the main bundle branches is a rarity. In fact there is scarcely a single absolutely convincing reported case, confirmed by pathologic examination, of bundle branch block. On the contrary, pathologic examination in cases diagnosed electrocardiographically as bundle branch block has for the most part failed to show definite bundle branch lesions.

However, it is common pathologic experience to find lesions in the lower third of the septum involving the wall of the left ventricle and, as will be shown, such lesions are the usual findings in cases diagnosed as bundle branch block.[1] Anatomically these lesions involve not only heart muscle but the arborizations of the conducting tissue (Purkinje fibers) as well.

THEORETICAL CONSIDERATIONS

The normal electrocardiogram is to be considered the result of the passage of an impulse at a normal velocity through the usual channels, that is, node of Tawara, main stem, bundle branches and arborizations, which consist of the so-called Purkinje fibers. The latter form a network covering practically the entire endocardial surface of the ventricles. The velocity of the impulse through Purkinje fibers is at least ten times faster than its rate through ordinary ventricular musculature. The impulse reaches the ventricle normally through the Purkinje fibers, stimulating the ventricular walls practically as a whole.[2]

It is conceivable that the passage of this impulse may be hindered at any point in the conducting system. An experimental injury of either right or left main branch may interrupt completely the passage of the impulse over normal channels to the corresponding ventricle, the spread then occurring through ordinary muscular connections. This gives a characteristic electrocardiogram differing in many respects from those to which we shall devote our attention. But the theoretical possibilities are not limited to a complete block of one or both bundle branches. A lesion only partly involving either bundle branch, or an extensive lesion of the arborizations of a branch such as occurs in human pathology, would cause a delay in the transmission of the excitation wave to the area supplied by the damaged conduction fibers. Such a lesion, if sufficiently extensive, should give observable changes in the electrocardiogram, and it is probable that these changes will be distinguishable from the changes that are produced by most other cardiac abnormalities.

These *a priori* considerations lead us to believe that there is an electrocardiogram that is characteristic of lesions involving part of a bundle or its arborizations. The agreement of pathologic and clinical experience with theoretical considerations supports our belief that there is a more than accidental relationship between the two.

Many of the cases we shall discuss cannot properly be termed bundle branch block and therefore we are introducing the term intraventricular block. By intraventricular block we mean any delay in conduction below the main stem of the bundle of His. Intraventricular block includes: (1) bundle branch block, and (2) arborization or Purkinje block, by which we mean interference with the conduction beyond the two chief branches of the bundle of His.

This disturbance of conduction may be permanent or temporary. The permanent changes we consider indicative of a definite pathologic lesion, generally myodegeneration. There are cases in which the electrocardiogram is temporarily of the type to be described.[3] Experimentally the changes can be produced by morphin, asphyxia, etc. Decompensation and agonal states do not as a rule produce these changes.

The criteria in the electrocardiograms that we have used are in general as follows:

1. Abnormal prolongation of the time interval of the QRS group beyond the normal limit of 0.1 second. This prolongation is most manifest in a widening of the R wave, so that its foot points are abnormally separated. The R wave no longer has its slender, tall, spike-like appearance, but is broader and sometimes blunter than normally.

2. Notching of the R wave. This notching may appear on the ascending or descending limb, on both limbs, or at the peak. It may be multiple, and its degree and location may vary slightly from beat to beat. In arrhythmias, the shorter the preceding interventricular interval, the more pronounced is the evidence of disturbed intraventricular conduction.

3. Low voltage as expressed by a low amplitude of the waves in all three leads. This change is not uniformly present, but when it occurs it helps to differentiate this type from the electrocardiograms typical of bundle branch block.

4. Absence of the typical diphasic curves with huge T′ waves found in experimental bundle branch block.

CLINICAL OBSERVATIONS

In the course of the past few years there have been observed sixty-two cases whose electrocardiograms indicated an intraventricular block. Four of these cases showed electrocardiograms more or less typical of bundle branch block. The other fifty-eight cases observed presented in their electrocardiograms the

* From the Electrocardiographic Laboratory, Mount Sinai Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Carter has reported a series of cases diagnosed as bundle branch block most of which we believe to be cases similar to those which we are about to describe.

2. Lewis and Rothschild: The Excitatory Process in the Dog's Heart, Part II, Ventricles, Phil. Tr. Roy. Soc. London, Series B, **206**, 181-226.

3. G. Canby Robinson has reported several such cases.

above mentioned criteria and were consequently interpreted as arborization block. The sixty-two cases presented the clinical pictures of cardiovascular renal disease, atherosclerosis, coronary artery disease, angina pectoris, myocarditis, syphilis, acute articular rheumatism, "grip," diabetes, gout, etc.

The ages of these patients summarized according to decades can be seen in the accompanying table:

AGES OF PATIENTS ACCORDING TO DECADES *

Age	Number
From 20 to 30 years	6
From 30 to 40 years	4
From 40 to 50 years	8
From 50 to 60 years	20
From 60 to 70 years	19
70 years or over	5
	62

* Average age 54.

An analysis according to sex shows that forty-eight were men and fourteen women.

Angina Pectoris.—Twenty-seven of the patients had definite attacks of angina pectoris, fifteen complained of precordial distress, and twenty gave no history of either symptom.

Blood Pressure.—It is interesting but not surprising that of the forty-eight patients on whom we had blood pressure determinations, twenty-five had a systolic pressure below 140 mm. of mercury; five between 140 and 160 mm.; seven between 160 and 180 mm., and eleven between 180 and 220 mm.

DISTURBANCES OF CARDIAC MECHANISM ASSOCIATED WITH INTRAVENTRICULAR BLOCK

1. There were thirty-five cases showing no arrhythmia; of these, twenty-four showed a left ventricular predominance according to the electrocardiogram, and one a right ventricular predominance. It is worth pointing out in this connection that in the presence of marked intraventricular conduction defects, the ordinary electrocardiographic criteria for hypertrophy may not hold.

2. Twelve cases showed auricular fibrillation.

3. Two cases showed auricular flutter.

4. Ten cases showed ventricular extrasystoles alone, and two others showed ventricular extrasystoles in combination with auricular fibrillation.

5. Five cases showed varying ventricular complexes.

Prognosis.—Special emphasis should be laid on the serious prognosis in patients showing electrocardiograms indicative of intraventricular block. Of the fifty-eight patients showing arborization block, twenty-two are dead, twenty-four are alive (and of these four are in a precarious condition) and twelve could not be traced. Of the patients whose fate is known, the mortality has been 48 per cent. within two years. It should be stated that only one of our patients is apparently well, but he has been under observation only five months. Of the four patients with more or less complete bundle branch block, three are dead, and one is in a precarious condition.

There have been twenty-two other patients suffering from angina that have not shown these electrocardiographic changes; of these, only one is known to be dead, seventeen are known to be alive, and sixteen of these seventeen are doing well or fairly well, and one, an old man of 77, is in a precarious condition. The average age of this group is 52 years.

On physical examination two signs have been especially noted: (1) a muffled, poor or practically absent first heart sound, and (2) a gallop rhythm. One is often struck by the fact that the heart is hypertrophied, but that the first sound, instead of being booming, has a poor or muffled quality.

ASSOCIATION OF ATRIOVENTRICULAR AND INTRAVENTRICULAR BLOCK

Intraventricular block is frequently associated with various grades of atrioventricular (auriculoventricular) block. These are not included in our analysis of sitxy-two cases. Of eighteen patients showing various grades of heart block, thirteen also presented evidence of intraventricular block. Only three of the eighteen patients are known to be dead, but these three had the combination of atrioventricular and intraventricular block.

PATHOLOGY

There have been necropsies in fourteen of the twenty-five known fatal cases. In eleven cases there has been an opportunity to examine the hearts grossly, as well as microscopically. In one case we secured only the septum including the atrioventricular bundle, and in two others, we have the necropsy reports and a single slide of heart muscle. Serial sections are being prepared.

1. At the present time we can report that eight of the cases showed coronary artery sclerosis with closure of the anterior descending branch of the left coronary. This artery gives off septal branches which supply the anterior part of the septum (the bundle of His and its two main divisions are supplied chiefly by branches from the right coronary artery). Four other cases showed a nodular sclerosis of the coronary arteries, but no actual occlusion.

2. Thirteen of the fourteen patients had a widely disseminated patchy sclerosis of the myocardium. Of the two that did not have coronary disease, one was a young girl aged 20, who had no known cause for the interstitial myocarditis except a recent "grip," the other was aged 30 and died of cardiac insufficiency resulting from valvular defects.

3. The pathologic changes, especially the sclerosis, predominate in the endocardial and subendocardial layers, that is, in the region of the so-called Purkinje network, as compared with the outer two thirds of the ventricular musculature.

4. In general, the changes were grossly more marked in the left ventricle than in the right.

Experimental work has been begun in collaboration with Dr. H. B. Williams, and at present it can only be stated that injury of the main branches or of the arborization produces changes in the electrocardiogram. It has already been shown by Eppinger and Rothberger[4] that extensive experimental injuries to the external layers of the ventricular wall do not result in changes in the electrocardiogram.

CONCLUSIONS

1. There has been a discrepancy between previous electrocardiographic interpretation and pathologic findings.

2. Theoretical considerations and pathologic findings point to the existence of a hitherto undescribed type of disturbance which we have called arborization block.

3. We venture to state, therefore, that there is a definite clinical condition to be known as arborization

4. Eppinger and Rothberger: Wien. klin. Wchnschr., 1909, **22**, 1091-1098.

block; that this condition can be diagnosed by the presence of a definite and permanent type of electrocardiogram; and that the condition has a very serious prognosis.

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ABSTRACT OF DISCUSSION

DR. H. B. WILLIAMS, New York: I have followed the work of Drs. Oppenheimer and Rothschild with interest because I have seen a number of cases of the same nature, but have been unable to secure necropsies in many of them. Dr. Rothschild has properly emphasized the fact that one cannot make a diagnosis of lesions of one main branch of the bundle of His when there is marked hypertrophy of a ventricle. The lesion referred to has often been made on the basis of the electrocardiogram without sufficient justification. I have seen but three cases in the last seven years in which I have felt reasonably secure in diagnosing this lesion.

The peculiar notched and deformed electrocardiograms which Dr. Rothschild has shown I have learned to look on as calling for a serious prognosis. Of a considerable number of such patients seen by me prior to 1915, only two are still living. One sometimes sees this type of electrocardiogram, however, in patients who get along tolerably well for a time. We should, therefore, make use of all the other available clinical evidence before making a decision.

DR. E. LIBMAN, New York: Apart from neuroses, aneurysm and pericarditis, the most common causes of severe attacks of cardiac pain are the following: hypertension, atherosclerosis of the arch with narrowing of the orifices of the coronary arteries or of their lumen, diffuse arterial disease in the coronary system, thrombosis of the coronary arteries and syphilitic lesions at the aortic valve or the root of the aorta. The cases with the classical picture of angina pectoris are mostly cases of coronary thrombosis. If one has had sufficient postmortem experience, it is very often not difficult to say whether there is a thrombosis of the coronary arteries, and at times it is possible to suspect whether the right or the left coronary artery is thrombosed. There are cases in which it is very difficult to say whether the patient is suffering from a gastric condition, such as ulcer, with reflex pain in the cardiac area, or whether the patient has coronary artery disease, or possibly both. In all such doubtful cases the electrocardiographic findings, as described by Drs. Oppenheimer and Rothschild, ought to be of value.

The cases in my own service at the hospital in which these findings were present were all cases in which I had assumed that the patient was suffering from organic heart disease of the coronary arteries—with the exception of one case of aortic insufficiency in a young man; this case did not come to necropsy, and it is therefore not known whether or not the patient had any disease of the myocardium. Complete closure of the coronary artery may occur very insidiously, and the patients make no complaint of any cardiac symptoms. Some of these patients can be recognized by a peculiar color of the face, an earthy color overcast by a leaden tint. In such cases an electrocardiographic examination might be of value in confirming the diagnosis. The diagnosis in such cases is particularly important if the question of operation on some part of the body has arisen. Such patients are apt to succumb within twenty-four to forty-eight hours after operation, although they have had no cardiac symptoms before.

DR. JAMES B. HERRICK, Chicago: I wish to add a word of commendation of this excellent work which has been done in the attempt to correlate the pathologic findings with the findings of the electrocardiograph. In Chicago we have been trying to get at this problem by experimental work on dogs, producing myocardial lesions by ligating branches of the coronary arteries. I think we will reach conclusions much like those presented to us today. Already we have begun to recognize in man curves which we have found in dogs which were operated on. In a man who had, as I believe, coronary thrombosis, the cardiogram was like that which we got in dogs by ligating the left branch of the coronary artery. The changes in the cardiogram described by Dr. Rothschild seem to be associated with very definite clinical evidences of myocardial weakness. A large percentage of the patients who have shown anything like that have died in a short time.

DR. M. A. ROTHSCHILD, New York: I should like to emphasize one point again. In the twenty-two cases of classical angina that we have included in our series that did not show the electrocardiographic criteria of arborization block, we have been able to follow seventeen patients, and only one of the seventeen is dead. In the other sixty-two cases, with or without angina, whose electrocardiograms presented the criteria of arborization block, the mortality has been approximately 50 per cent. in two years. In our experience, therefore, the electrocardiogram gives valuable evidence in regard to prognosis, especially in those doubtful cases of angina.

HOOKWORM INFECTION AS A MEDICO-MILITARY CONSIDERATION

RECENT EXPERIENCES WITH SOUTHERN TROOPS DURING MOBILIZATION ON THE MEXICAN BORDER *

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Following the call of the President, June 18, 1916, approximately 10,000 men were mobilized at Nogales, Ariz. These troops, with the exception of 1,200 regulars, were composed of organizations of the National Guard from northern, eastern and Pacific states. They had very little sickness. The morbidity rates for August, September and the first three weeks in October varied from 14 to 35 per thousand for the regulars and from 7 to 29 per thousand for the National Guard. The average morbidity rate for regulars was 23.1 per thousand while that of the National Guard was somewhat lower, 17.9 per thousand.

During the last week in October, 1916, a brigade of the Alabama National Guard was mobilized at Nogales. This command consisted of headquarters, three regiments of infantry, an ambulance company, a field hospital and a company of Signal Corps troops. Shortly after the arrival of these troops the morbidity rates began to soar. During November, acute respiratory infections—colds, grip and bronchitis—reached epidemic proportions, and the base hospital was taxed to its full capacity. In December, pneumonia and measles became epidemic and continued until March.

TABLE 1.—INCIDENCE OF PNEUMONIA, NOGALES DISTRICT

Organization	No. Cases	No. Deaths	Per Cent. Mortality
First Alabama Infantry	63	17	26.9
Second Alabama Infantry	28	4	14.3
Fourth Alabama Infantry	28	6	21.4
First Alabama Ambulance Company	2	0	
Alabama Signal Corps (one company)	2	0	
Total	123	27	21.9
Medical Department, U. S. Army	3	0	
Twelfth U. S. Infantry	8	1	12.5
Battery D, Sixth U. S. Field Artillery	1	1	100
First U. S. Cavalry (two troops)	1	0	
Battery C, First California Field Artillery	1	0	
Second Squadron, First Utah Cavalry	2	0	
Second Idaho Infantry	1	0	
Total	17	2	11.6

* From Department Laboratory No. 3, Southern Department, U. S. Army, Nogales, Ariz.

There were 140 cases of pneumonia with twenty-nine deaths. Two-thirds of the cases were of the frank, primary, lobar type, and the remainder complicated or followed measles. The incidence of pneumonia by organizations is shown in Table 1.

In addition to the pneumonia outbreak and the prevalence of less serious respiratory infections, measles became a serious sanitary consideration. The epidemic began in December, and continued until March. Several hundred cases, confined almost wholly to the Alabama troops, occurred during the epidemic. The curve of the epidemic showed three distinct outbreaks separated roughly by a period corresponding to the incubation period of measles. Over 400 cases occurred in the first outbreak. Complications and sequelae—notably pneumonia, sinus involvements and otitis media—were common, and a number of deaths resulted.

Official data submitted by the organization commanders of the First Alabama Infantry covering a four month period—Oct. 24, 1916, to Feb. 24, 1917—show that of the 963 men composing the regiment, February 24, 809, or 84 per cent., had been on sick-report for some cause at some time or other. Similar data, for the same period, submited by company commanders of the Fourth Alabama Infantry, show that 859 reported sick, or 85.7 per cent. of the 1,002 men composing that command. Figures for the Second Alabama Infantry are not available; but it is believed that the morbidity approximated that of the other regiments. Such morbidity rates as these, were they to prevail throughout an army in campaign, would result in the breaking down of the most elaborate and splendidly equipped medical department conceivable; and the training, mobility, morale and efficiency of the forces would be so interfered with as to render them practically ineffective as combatant troops.

During this period there were no epidemics in the civil community. Measles was not prevalent, and data obtained from the civilian practitioners show that but thirty cases of pneumonia were encountered among 8,800 civilians—the combined population of Nogales, Ariz., and Nogales, Sonora. The morbidity rates for all other troops—both regulars and National Guard—were at times high, but never abnormally so. The environment and conditions under which the Alabama troops lived were identical with those of the other troops. All were furnished the same ration, the same clothing and bedding, the same type of shelter, an unimpeachable water supply, a uniform system for the disposal of excreta and wastes, and ideal camp sites. Comprehensive sanitary measures to decrease the morbidity were clearly defined by the district surgeon and sanitary inspector—a medical officer of experience, great force and resourcefulness; and these were promptly promulgated and made effective by an equally experienced and forceful commanding general. Despite every effort, the morbidity rates remained high.

It was apparent that factors not common to the other troops determined the high incidence of disease in the Alabama command. Comparison of their morbidity rates with those of the regulars might have led, offhand, to the conclusion that the sickness was due to inexperience in personal hygiene and camp sanitation. Comparison with the other National Guard troops—equally inexperienced, recruited from the same walks of life, and living under identical conditions—militates against the acceptance of any such conclusion. Certain of their own medical officers believed that the climatic conditions exerted a determining influence. Nogales, however, is looked on as one of the most healthful points on the border, and its health record previously had been an enviable one. The town is situated in a hilly country at an elevation of 3,864 feet. The official climatologic data show that during the months of November and December, when much of the illness occurred, the maximum temperatures were 90 and 77 F., and the minimum temperatures 20 and 12 F., respectively. A bulletin of the Arizona Experimental Station states that to get the appreciable higher temperatures here, it is necessary to subtract from 15 to 30 degrees from the maximum. In other words, the extreme dryness of the air makes Nogales that much cooler than the "humid" east with corresponding temperatures. At the other end of the thermometer the appreciable temperatures are higher than those actually registered, from the same cause. The fact remains that a considerable fall in temperature—frequently 30 or 40 degrees—may occur between noon and midnight. While this change might be potent for harm in persons whose health had been undermined otherwise, the experience of troops stationed here previously indicates that it has no deleterious effect on persons of average robustness and resistance.

TABLE 2.—INCIDENCE OF HOOKWORM INFECTION, FIRST ALABAMA INFANTRY

Organization	Number Examined	Number Positive	Number Negative	Per Cent. Positive	Home Station
Hdqrs. Company..	41	12	29	29.3	Mobile, Mobile Co.
Det. Med. Dept..	15	2	13	13.3	Mobile, Mobile Co.
Supply Company..	24	6	18	25.0	Various places.
Machine Gun Co..	44	7	37	15.9	Mobile, Mobile Co.
Company A.....	41	13	28	31.7	Mobile, Mobile Co.
Company B	20	11	9	55.0	Bay Minette, Baldwin Co.
Company C	64	35	29	54.6	Geneva, Geneva Co.
Company D	33	16	17	48.4	Fort Deposit, Lowndes Co.
Company E	57	18	39	31.9	Mobile, Mobile Co.
Company F	51	26	25	51.9	Dothan, Houston Co.
Company G	62	26	36	58.0	Brewton, Escambia Co.
Company H	62	31	31	50.0	Troy, Pike Co.
Company I	65	37	28	56.9	Enterprise, Coffee Co.
Company K	62	39	23	62.9	Castleberry, Conecuh Co.
Company L	56	36	20	64.2	Slocomb, Geneva Co.
Company M	47	17	30	36.1	Mobile, Mobile Co.
Totals	744	342	402	45.7	

Lieut.-Col. Thomas C. Bratton, Medical Corps, the district surgeon and sanitary inspector, who had had experience with the same troops at Manassas several years previously, believed from the first that the high morbidity was due to hookworm infection and latent malaria. By Colonel Bratton's direction, each Alabama soldier admitted to the hospital was examined for malaria and hookworm infection. Later, as it became apparent that hookworm infection was exceedingly common, the survey was amplified so as to include Alabama soldiers in camp as well, and steps were immediately taken to treat those who showed infection.

Blood examinations in the cases of 236 Alabama soldiers admitted to hospital showed but 0.3 per cent. in whom plasmodia were demonstrable. It is probable that this does not represent the true malaria index, as many of the men took quinin before admission—a common custom of people from malarial districts—and demonstration of the plasmodium may have been obviated in this way in many cases. The findings did not indicate that latent malaria was unduly prevalent, however, and a general malarial survey was not deemed advisable.

The hookworm survey consisted of the examination of 1,259 men. The majority of these were from the First Alabama Infantry, in which regiment an attempt was made to examine every one. A little over one third of the Fourth Alabama Infantry were examined prior to their departure from Nogales. The data on

TABLE 3.—INCIDENCE OF HOOKWORM INFECTION, SECOND ALABAMA INFANTRY (INCLUDES SICK IN HOSPITAL ONLY)

Organization	Number Examined	Number Positive	Number Negative	Per Cent. Positive	Home Station
Hdqrs. Company..	3	1	1	33.3	Montgomery, M'gomery Co.
Det. Med. Dept...	0	0	0	....	Montgomery, M'gomery Co.
Supply Company...	6	2	4	33.3	Various places.
Machine Gun Co..	12	7	5	58.3	Andalusia, Covington Co.
Company A	5	3	2	60.0	Montgomery, M'gomery Co.
Company B	15	5	10	33.3	Birmingham, Jefferson Co.
Company C	7	1	6	14.2	Birmingham, Jefferson Co.
Company D	12	6	6	50.0	Montgomery, M'gomery Co.
Company E	5	4	1	80.0	Florala, Covington Co.
Company F	7	4	3	57.1	Tuscaloosa, Tuscaloosa Co.
Company G	19	6	13	31.5	Piedmont, Calhoun Co.
Company H	14	6	8	42.8	Andalusia, Covington Co.
Company I	11	8	3	72.7	Luverne, Crenshaw Co.
Company K	11	2	9	18.1	Sheffield Colbert Co.
Company L	11	3	8	27.2	Tallassee, Elmore Co.
Company M	11	7	4	63.6	Samson, Geneva Co.
Totals	149	65	84	43.6	

the Second Alabama Infantry include only patients admitted to hospital, and show but 149 examinations. Of the 1,259 men examined, hookworm ova were demonstrated in the feces of 503, or 39.9 per cent. The incidence of infection is shown in detail in Tables 2, 3 and 4.

Reference to these data and to a map of Alabama shows that the organizations in which the incidence of hookworm infection was greatest came from the low, flat, river-intersected portion of the state lying south of the thirty-third degree of north latitude. It was among troops from this section of the state, likewise, that the morbidity and mortality was highest. Capt. Thomas J. Flynn, Medical Corps, who has recently compiled the clinical data gathered during the pneumonia outbreak, informs us that 90 per cent. of the cases of pneumonia occurred in soldiers from the southeastern quadrant of the state, irrespective of the regiments to which they belonged. That portion of the state lying north of the thirty-third parallel is

TABLE 4.—INCIDENCE OF HOOKWORM INFECTION, FOURTH ALABAMA INFANTRY

Organization	Number Examined	Number Positive	Number Negative	Per Cent. Positive	Home Station
Hdqrs. Company ..	3	1	2	33.3	Montgomery, M'gomery Co.
Det. Med. Dept..	2	1	1	50.0	Birmingham, Jefferson Co.
Supply Company .	0	0	0	....	.....
Machine Gun Co.	29	11	18	37.8	Montgomery, M'gomery Co.
Company A	42	8	34	19.0	Montgomery, M'gomery Co.
Company B	16	10	6	62.5	Abbeville, Henry Co.
Company C	19	5	14	26.3	Pell City, St. Clair Co.
Company D	15	7	8	46.6	Bessemer, Jefferson Co.
Company E	33	2	31	6.0	New Decatur, Morgan Co.
Company F	11	4	7	36.3	Gadsden, Etowah Co.
Company G	15	8	7	53.3	Ozark, Dale Co. (Co.
Company H	24	10	14	41.7	Alexander City, Tallapoosa
Company I	31	9	22	29.0	Opelika, Lee Co.
Company K	47	6	41	12.8	Birmingham, Jefferson Co.
Company L	48	5	43	10.4	Alabama City, Etowah Co.
Company M	31	9	22	29.0	Oxford, Calhoun Co.
Totals	366	96	270	26.2	

mountainous or hilly, and the lesser incidence of hookworm infection is readily explained by the less favorable soil and climate for the development of the hookworm larvae. Another interesting fact, that is in accord with the observations of numerous investigators, is that the incidence among troops from the large cities—Birmingham, Montgomery and Mobile—was only approximately one-half as great as that among troops from the smaller towns and rural communities. This may be explained by the greater degree of soil pollution in rural districts and the relatively greater frequency with which rural people go barefooted. The comparative figures for cities and smaller communities, and for the sections of the state north and south of the thirty-third parallel are given in Tables 5 and 6.

SUMMARY AND COMMENT

It has been shown that 39.9 per cent. of 1,259 men, chosen at random from the organizations composing a brigade of the Alabama National Guard, were infected with hookworm. Furthermore, it has been shown that these troops proved exceedingly prone to infectious diseases—notably pneumonia and measles—when placed under conditions simulating those of field service. That this susceptibility was due to something inherent in this particular body of men, that was not common to other organizations, seems evident in view of the way in which the situation was controlled by the absence of any such degree of susceptibility in other troops living under identical conditions.

In addition to an untoward susceptibility to intercurrent infections, there was an equally evident absence of resistance to infection once acquired. The

TABLE 5.—COMPARISON OF INCIDENCE IN LARGE CITIES AND SMALLER COMMUNITIES

	Examined	Positive	Per Cent. Positive
Birmingham	71	13	18.3
Montgomery	99	30	30.3
Mobile	245	69	28.1
Totals	415	112	26.9
Towns and rural districts	813	383	47.2

TABLE 6.—COMPARISON OF INCIDENCE NORTH AND SOUTH OF THIRTY-THIRD PARALLEL

	Examined	Positive	Per Cent. Positive
Troops from North	265	57	21.5
Troops from South	963	438	45.3

mortality from pneumonia was much higher than that of the other troops, and complications and sequelae were common. Measles ran rampant throughout these troops, and its complications were numerous and, in many cases, grave. Pneumonia exacts its greatest toll from the aged, the impoverished, the ill-fed, the alcoholic and the otherwise debilitated; while measles, a disease attended with a mortality of only 2 or 3 per cent. in private practice, causes great concern in institutions, among the poorer classes and in armies. In short, these diseases work great havoc only where the soil has been prepared previously by some debilitating agent. In the instance of the Alabama troops under discussion we are convinced that hookworm infections of considerable chronicity acted as the predisposing factor.

Whether the hookworm exerts its debilitating effect by abstraction of blood with a resulting anemia; by mechanical injury to the intestinal mucosa followed by infection, or by the production of a toxin are, we believe, still moot questions. In view of the susceptibility to pneumonia shown in this communication, and the well known susceptibility of these patients to tuberculosis, it is possible that the tissue resistance of the lung may be reduced by the mechanical traumatism induced by the passage of the larvae through the lung in their circuitous route from the skin to the intestine. At any rate, many of the men observed

here showed a very definite degree of debility, characterized by mental and physical apathy, malnutrition, underdevelopment and marked anemia. It is believed that these factors combined greatly to reduce or render nil the natural resistance to intercurrent infections, and that these individuals would have become virgin soil for any micro-organism with which they came in contact.

The high incidence of measles may be attributed in part to the fact that many of the men were from rural districts and had not, therefore, been exposed previously. But, that the devitalizing effects of hookworm infection were also factors is evident from the altogether untoward frequency and gravity of complications and sequelae. Many of the measles patients gave a history of having had measles previously, and a number of patients were readmitted with measles after having recovered from a typical attack shortly before. As reinfection in measles is extremely rare ordinarily, it seems not only that hookworm infection had sapped the natural resistance to infection but also that the degree of immunity conferred by an infection was also below par.

Another consideration in connection with this problem is the possibility, under favorable conditions, of troops from hookworm-infected districts spreading the disease broadcast throughout previously uninfected districts to which they may be sent. This danger from immigration has been anticipated in California by the establishment of rigid quarantine measures against certain classes of immigrants from the Orient. When one contemplates that a division at war strength recruited indiscriminately in any of the heavily infected hookworm districts of the South would contain approximately 10,000 potential soil polluters, the existence of a real rather than a fancied menace becomes apparent.

Hookworm infection is extremely prevalent in sections of Virginia, both of the Carolinas, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas and Kentucky. Cases have been reported from Oklahoma, California and Missouri. We believe it is the manifest duty of those charged with the physical examinations in these states to exercise the greatest care in the selection of recruits. In our opinion, only individuals in robust health should be accepted; and anemia, lassitude, underdevelopment, or complaint of digestive disorders, with a history of "ground itch" should constitute causes for "sight rejection." Examination of the feces of recruits from Southern States for hookworm ova, although not mandatory at present, should be a part of any thoroughly conducted examination.

Rosenau[1] states that the best part of a hookworm campaign is the collateral good it does. He cites the instance of Bilibid prison, Manila, where the annual death rate from all causes was 234 per thousand when the Americans took charge. This was reduced to seventy-five per thousand by general sanitary measures — boiled water, screening, disinfection, better food, less crowding, etc. — "but despite these sanitary improvements the death rate could not be hammered down below seventy-five per thousand." Then it was found that many of the prisoners were infected with hookworms. They were freed of their worms by treatment with thymol, and the annual death rate from all causes fell to 13.5 per thousand.

It seems probable that the inauguration of systematic hookworm surveys throughout the southern troops now in the service and in all mobilization camps in the Southern States, together with systematic treatment of those found infected, would not only reduce uncinariasis itself to a minimum, but would also reap incalculable collateral benefits.

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1. Rosenau, M. J.: Preventive Medicine and Hygiene, Ed. 2, New York, D. Appleton & Co., 1916, p. 132.

ACUTE PANCREATITIS *

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The pancreas is the most important of the digestive organs. Not until recently, however, have the frequency and importance of its diseases been recognized. The peculiarities of its situation, anatomy and function exercise a profound influence on the etiology and course of the inflammations which attack this organ and must be understood in order to treat these affections on rational lines.

It has been sufficiently emphasized that pancreatitis is in the majority of instances due to infection propagated from some adjacent focus, in most instances the biliary tract. For a time this close interdependence was thought to be due to the fact that the terminal ducts of the liver and pancreas either anastomose in the ampulla of Vater or lie in immediate proximity, thus affording an opportunity for descending inflammation of the one duct to become an ascending inflammation of the other. While this method of infection may be the correct explanation of certain cases of pancreatitis, in the majority of instances much doubt has been cast on this route of extension. The work of Bartels, Arnsperger, Franke, Deaver and Pfeiffer, and Sweet has seemingly established the fact that such extension commonly occurs by way of the lymphatics which form a rich anastomosing network in the retroperitoneal tissues about the pancreas. As the gallbladder is the upper abdominal organ most commonly affected by chronic infection it is but natural that pancreatic inflammation is most often secondary to that focus. However, sufficient clinical evidence is at hand to indicate that pancreatitis may in the same manner result from duodenal ulcer, particularly when situated in the second portion of the duodenum, and probably from colitis through the medium of the lymphatics leading off from the colon through the transverse mesocolon to the pancreas situated immediately beneath its attachment. Probably still more distant foci, such as the appendix and the pelvic organs, may in some instances succeed in transmitting infection retroperitoneally to the pancreas by way of the ascending lymph channels. I have met with two cases of small circumscribed abscess of the pancreas in perforative appendicitis, and one abscess of the pancreas in the presence of retroperitoneal diffusion of pus the result of an infection of the left lower extremity.

These considerations emphasize the importance of dealing promptly and efficiently with foci of infection within the abdominal cavity, and point to the danger of permitting lurking and latent infections to exist in a more or less quiescent state. In other words, the curative methods of surgery are enhanced in value as opposed to the palliative methods of medical treatment.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

So important and definite of late have been the evidences of metastatic systemic infection from some inconspicuous focus that it is not unlikely that we shall find certain cases of pancreatitis to be due to this type of infection. The analogy of the severe and sudden onset of hemorrhagic pancreatitis with other conditions of the sort, as for instance hematogenous infection of the kidney, is at least striking. As yet, however, this method of pancreatic infection is mere speculation. Since Fitz drew attention to the striking lesion of acute hemorrhagic pancreatitis we have learned that not all acute inflammations of the pancreas are accompanied by hemorrhage, but that here as elsewhere inflammatory lesions occur in varying degrees of severity. Hemorrhage is as variable in extent and degree as fat necrosis, and probably for a similar reason. The most important recent contribution to an understanding of the pecularities of acute pancreatitis and its effects has to do with the ferments of the pancreas.

Since Balser first observed and wrongly interpreted the significance of certain grayish flecks in the abdominal fat the correct explanation of these areas of fat necrosis has been found in the action of the fat-splitting ferment, lipose, which finds its way into the tissues under the circumstances of acute inflammation of the pancreas and attacks the fat. The resulting areas of necrosis are now so well known to be connected with acute pancreatic inflammation as to furnish one of the most striking and reliable diagnostic guides to the surgeon.

The action of the protein-splitting ferment, trypsin, has escaped attention until recently. It is evident that any inflammation which causes a diffusion of lipase must also carry with it the remaining ferments which are always present in the pancreatic secretions. Trypsin as a factor in the syndrome of acute pancreatitis has escaped attention because it has given no such ocular evidence of its presence in the tissues as has lipase in the areas of fat necrosis. Possibly this should be qualified by saying that the hemorrhage which is so striking a feature of some cases is possibly due to the digestive action of the trypsin on the vessel walls.

Trypsin is one of the most powerful ferments elaborated within the body. In weakly alkaline solution it attacks protein with great activity, breaking it up into its lower constituent molecules. When this takes place within the intestinal canal the process is that of normal digestion and the end-products of such digestion are fitted for absorption and use in metabolism. Such an important and active agent, when directed against the tissues of the individual that produces it, is capable of much harm. Just why the pancreas escapes self-digestion under normal circumstances is too abstruse a problem for brief discussion, but at least one of the reasons is to be found in the fact that the ferment as secreted by the pancreas is inactive and is known as protrypsin. Pure pancreatic juice as obtained fresh and uncontaminated from the pancreatic duct will not digest protein. It requires for activation some substance or substances which will convert its latent properties into active energy. Normally this is supplied by the so-called enterokinase of the duodenum. Experimentally activation may be produced by the action of calcium salts, by the products of aseptic necrosis of tissues and by certain bacteria.

We see briefly, therefore, that it is possible for inactivated pancreatic juice to be extravasated into the tissues without loosing on them the destructive action of the trypsin on the tissue cells. If, however, the conditions are such that the trypsin is activated, its digestive action becomes apparent. Tissue cells are attacked and destroyed. The delicate vessel walls of the pancreas and surrounding structures are injured and permit the escape of blood and the result is acute hemorrhagic pancreatitis.

The consequences of this action of trypsin may be traced even further with a fair degree of certainty from inference and demonstration. Whipple, Stone and Bernheim, and others, in their work on the toxemia of intestinal obstruction, have shown the existence of a powerful toxin which is produced in acute obstructive conditions and proves fatal in exceedingly small doses. Whipple has shown that this substance answers all the characteristics of a primary proteose, a substance which is one of the earliest decomposition products of protein when acted on by trypsin. Sweet has called attention to the close resemblance of the toxemia of acute pancreatitis to that of high intestinal obstruction. It does not seem unlikely that the close resemblance is due to the fact that the toxemia of both conditions is either the same or is closely related, being due to the toxic derivations of tryptic action on protein materials.

I emphasize these apparently theoretical considerations because of the important bearing that these conceptions, if true, have on actual practice.

Acute pancreatitis, according to the severity of its onset and course, may be classified clinically as ultra-acute, acute and subacute. The ultra-acute variety is characterized by sudden onset of great severity with pain, shock and continued vomiting. Hemorrhage into the pancreas and its surroundings is profuse. Though the primary shock may abate, the subsequent course of the disease is progressively downward and death usually occurs within three days, the pancreas being found completely infiltrated, hugely swollen and in a condition of necrosis and gangrene more or less advanced, according to the time which has elapsed since the beginning of the seizure.

Acute pancreatitis differs from the above in the severity of the attack. The onset is usually sudden, but less severe, and the rallying power of the patient is more in evidence. Pancreatic hemorrhage is a feature, but the organ shows less swelling and may have escaped this process in some portion. If the early toxemia is not fatal general improvement gradually occurs, and it will be found that a portion of the organ has remained unaffected or will recover itself. The most affected part undergoes necrosis and gangrene and as a rule suppuration promptly ensues. In very rare cases pyogenic infection does not follow and recovery takes place with the formation of an aseptic hemorrhagic cyst. As a rule, sepsis supervenes and unless relieved leads eventually to the death of the patient.

Subacute pancreatitis, which is not uncommon, is usually an affection limited to the head of the organ. Occasionally an interstitial hemorrhage of small extent is present. More often no hemorrhage occurs, but the pancreatic head is swollen and tender, though not often distinctly palpable. The symptoms usually erroneously attributed to gastritis, gallstones, ulcer, or masquerading as "acute indigestion," are upper abdominal pain, nausea, and often vomiting. The pulse and temperature are but little affected unless complicating inflammation of the organ is present. Very often

cholecystitis accompanies and may have inaugurated the condition. A history of previous attacks is not uncommon and it is not uncommon to find that the subject of the acute or ultra-acute forms of the disease has had preliminary attacks of the subacute variety.

The treatment of the different forms of acute pancreatitis will naturally vary with the type of the disease.

In the ultra-acute and acute varieties immediate operation should be the rule. Under our modern conception of the mechanism of the production, course and effects of acute pancreatitis it is essential that the combined products of infection and ferment action should be afforded an exit from the body, in order to prevent the deadly effects of absorption. The prime object therefore is early and adequate drainage. The most satisfactory approach in this stage is through an anterior incision exposing the pancreas either through the gastrocolic omentum or the gastrohepatic ligament, depending on whether the stomach is situated high or low.

The pancreas should be freely incised in a longitudinal direction or numerous blunt punctures made in its substance, thus giving vent to the contained blood, lymph and obstructed secretions. Both gauze and tube drainage should be laid down to the surface of the organ and conducted to the surface through an enveloping sheet of rubber dam to minimize adhesions to the stomach and intestines.

The only exception to the rule of immediate operation are: (1) in case of severe shock, when sufficient time should be given for recovery under the aid of active stimulation and saline infusion; (2) when the patient at the time observed is obviously improving from the effects of the disease. In the first case the delay is a simple matter of surgical judgment. In the second case the course of events has fortunately demonstrated that the patient does not belong to the ultra-acute type and will be no worse and probably better for a shorter or longer period of observation.

That these symptoms are not theoretical only but accord with practice can be seen in the results of the last thirteen operations for acute pancreatitis made by me. Three cases resulted fatally, a mortality of 23 per cent. One of the fatal cases was of the ultra-acute variety. The woman, aged 38 years, had been sick only one day when operated on. Death occurred on the operating table before anything could be done. The second case was also a woman, aged 30 years. At operation stones were found in the gallbladder and common duct. The pancreas was enlarged and areas of fat necrosis were noted in the surrounding fat. The stones were removed by cholecystostomy and choledochostomy. The pancreas itself was not opened or drained. The postoperative course was stormy and septic in character. Three weeks later an inflammatory mass presented in the left loin and her condition was grave. An incision through the loin evacuated a quantity of bloody and purulent débris, but she succumbed from weakness and toxemia shortly after the operation. Postmortem examination showed the pancreas to be gangrenous and disorganized.

The third fatality occurrend in the case of a man aged 29 years. His attack was typical and the operation was made two days after onset. The pancreas was swollen and numerous stones were present in the gallbladder, which was opened and drained. The pancreas was not incised or explored. The postoperative course was progressively downward and he died in two weeks. Necropsy revealed hemorrhagic and suppurative pancreatitis.

The first case mentioned was beyond redemption by any treatment. Cases of pancreatitis occur of such severity that the patient is doomed from the onset. Experimental work has shown that the pancreas may be damaged in an instant by the forcible injection of bile or many other substances into the duct of Wirsung, following which acute hemorrhagic pancreatitis makes its appearance and runs a fatal course. It is apparent that a very brief space of time may suffice to inaugurate the combination of trauma, ferment and infection that will proceed inevitably to gangrene and disorganization of the pancreas. These are the true ultra-acute cases and are fortunately of rare occurrence.

In the remaining two cases it will be seen that drainage of the biliary tract did not prevent the further development of the pancreatic disease and a fatal outcome.

On the other hand, in five cases in which the pancreas was freely drained, all recovered. In one case pancreatostomy alone was made; in the remaining four, cholecystostomy for stones was done in addition. In the case of two other patients that recovered, besides a cholecystostomy, gauze drainage was carried down to the surface of the pancreas, which was not incised or punctured. I cannot but feel that in the two fatal cases primary pancreatic drainage would have greatly increased the chance of recovery. In the remaining three cases the only operation was a cholecystostomy. Of five cases therefore in which the pancreas was not drained and the only operation was removal of stones and drainage of the biliary tract, three patients recovered and two died. During the period covered by these cases there were observed in the medical wards of the German Hospital six cases diagnosed as acute pancreatitis, in which operation was refused. Two of these patients died and four recovered so that the mortality of expectant treatment was slightly less than that of operation without drainage of the pancreas. Körte from his large experience with this disease recommends free pancreatic drainage. It seems safe to conclude, therefore, both from our knowledge of the nature of the disease and on the basis of practical experience that this procedure is called for in acute pancreatitis.

In the case of circumscribed pancreatic collections, abscess of the lesser peritoneal sac and in peripancreatic suppuration, drainage of the abscess cavity alone is indicated. Such collections not uncommonly present in the left loin and may be advantageously evacuated at that point.

The advisability of supplementing drainage of the pancreas with operations on the biliary tract if stones or inflammation be present will be determined by the condition of the patient and the experience of the surgeon. Occasionally there are cases of such severity that it is unjustifiable to do more than the prime object of the operation, which we must regard as drainage. Usually there is ample margin of safety for the experienced abdominal surgeon to open, empty and drain the gallbladder and common duct if necessary. Stones in the common duct should certainly be removed if the condition warrants. In a number of instances I have removed the appendix.

The important practical points in connection with the subject of acute pancreatitis are: (1) the secon-

dary relationship of the disease to preexisting intra-abdominal foci of infection; (2) the lethal character of the toxemia; (3) the necessity for prompt action, and (4) the value of direct and free drainage.

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ABSTRACT OF DISCUSSION

DR. RUSSELL S. FOWLER, Brooklyn: Pancreatic disease is dependent on infection, either hematogenous or lymphatic, secondary to a lesion in a neighboring organ. This latter I believe to be the more frequent.

Routine palpation of the pancreas in all laparotomies which permit of it leads to the conclusion that the majority of the cases of long standing gallbladder disease show palpable alteration in the structure of the pancreas.

The diagnosis of cholelithiasis complicated by acute pancreatic necrosis is made difficult, as the patient usually describes the symptoms of gallstone colic. The first thing thought of is a severe attack of cholecystitis and cholangeitis.

When a patient with gallbladder disease suffers severe attacks of pain located more to the left, and when on palpation the left side is found more resistant than the right, the first thing to think of is acute pancreatitis. Of course there must be taken into consideration all the other symptoms, such as fever, rapid pulse, collapse and occasionally tympanites, and although the same symptoms may occur in cholecystitis and cholangeitis, still the entire symptomatology of acute pancreatitis seen once leaves such an impression that should such a picture again present itself acute pancreatitis will at once be thought of, and this diagnosis will usually be correct.

Cases occur which are diagnosed as cholangeitis and which are in reality pancreatitis; or a disturbance of the pancreas may be diagnosed which in reality is a cholecystitis. At all times acute pancreatic necrosis, in comparison with cholecystitis or cholangeitis, is the more dangerous. Operative procedure for the pancreatic necrosis must be undertaken first. This consists of incision and tamponade.

1. Should the patient be very weak, a simple incision should be made and tamponade of the pancreas should be done. As a rule this is all that can be done in severe cases.

2. In cases not so severe, a cholecystostomy is performed in addition to incision and tamponade of the pancreas. The removal of the gallbladder and drainage of the common bile duct are left for a possible secondary operation.

3. If the vitality of the patient is good, operative procedure for the cure of the inflammation of the gallbladder and bile duct, as well as the cure of the acute pancreatitis, can all be undertaken. The ideal method is to expose the pancreas, liberally incise the area affected, tamponade and perform cholecystectomy and T-drainage of the common bile duct.

DR. R. H. C. GIBBONS, New York: In all cases of acute pancreatitis we cannot make a diagnosis until we open the abdomen, which should be done quickly; then sufficiently deal with conditions found. Remove gangrenous parts. Establish drainage through a rubber glove, into which carry the strong-gauze tape.

DR. WILLIAM LINDER, Brooklyn: As has been said, there are no pathognomonic signs or symptoms of acute pancreatitis. In the last two years we have been able to make a correct diagnosis in 70 per cent. of our sixteen cases. In the early stage, surgery is of benefit; in the very acute cases the patients may die before reaching the operating table. The pain in a severe case of acute pancreatitis is excruciating—severer than that of any other upper intra-abdominal condition.

Puncturing a Diet Dogma.—Another popular formula which has been elevated to the height of dogma is, "it is not what you eat but what you digest that is of importance." Since the normal person very completely digests all the common foodstuffs, there is little to concern one in this saying. Repeated ignorantly from mouth to mouth, such a remark, even though true, comes to cloak many dietetic absurdities.—Graham Lusk in *Science*.

NEPHRITIS FROM THE STANDPOINT OF UREA EXCRETION*

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That nephritis, and particularly the form commonly known as chronic interstitial nephritis, is associated with alterations in the excretion of nitrogenous waste products, especially urea, has long been known. During the past few years the introduction of simpler methods for quantitative determination of the nitrogenous constituents of the blood has led to numerous clinical studies of the condition now known as urea retention. In its proper sense this term would imply a continuous positive nitrogen balance, with a constantly increasing amount of urea in the blood and tissues. In actual use, however, the term is applied to any condition associated with an increased concentration of urea in the blood, without reference to the nitrogen balance, and the finding of a blood urea concentration higher than the average normal is called urea retention and is taken to indicate disturbed renal function.

It is my purpose to attempt to make clear what actually happens in the condition of urea retention. Urea retention in the sense in which the term is now used is not a continuous process of piling up urea in the body, due to an inability of the kidneys to excrete the large amounts of urea formed in the body. As I shall show, the kidneys may be actually able to excrete far greater amounts of urea than they are ordinarily called on to do, even in severe cases of nephritis, while the condition known as urea retention exists in these cases at the lower levels of protein metabolism just as it does at the higher, even though in the former instance the blood urea figure may be used within normal limits.

The credit for the present conception of the mechanism of urea retention is due to Widal and Javal.[1] On their work were based the later studies of Ambard and Weill[2] and of myself.[3]

Widal and Javal kept a woman, aged 34, under observation for four months, during which time the nitrogen balance was carefully observed. The patient had been ill for one year with chronic nephritis. They found that she came into nitrogen equilibrium readily after changes in diet, though somewhat more slowly than a normal person. They also found that the concentration of urea in the blood bore a direct relation to the diet, and on a constant nitrogen intake was practically constant. After changes in diet, the blood urea could be restored to the former level by a return to the original diet. They succeeded in causing the concentration of urea in the blood to increase from 0.36 to 1.93 gm. per liter by increasing the nitrogen intake. As a result of their experiment, they concluded that the fluctuations in level of blood urea were due to the changes in diet, and that the increased concentration of urea in the blood, which occurred in

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* From the Hospital of the Rockefeller Institute for Medical Research.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Widal, F., and Javal, A.: Compt. rend. Soc. de biol., 1904, **57**, 301, 303.

2. Ambard, L.: Compt. rend. Soc. de biol., 1910, **49**, 411, 506. Ambard, L., and Weill, A.: Jour. physiol. et path. gén., 1912, **14**, 753.

3. McLean, F. C., and Selling, L.: Jour. Biol. Chem., 1914, **19**, 31. McLean, F. C.: Jour. Exper. Med., 1915, **22**, 212, 366; Clinical Determination of Renal Function by an Index of Urea Excretion, THE JOURNAL A. M. A., Feb. 5, 1916, p. 415.

response to increased nitrogen intake, effected the elimination of increased amounts of urea through the kidneys. In other words, high nitrogen intake, relatively high blood urea, and high rate of excretion were found to be parallel and interdependent phenomena, as were low nitrogen intake, relatively low blood urea, and low nitrogen output. The foregoing hypothesis received further support from the work of Ambard and Weill,[2] who demonstrated that the rate of urea excretion depends primarily on the concentration in the blood. Numerous observers have confirmed the observation of Widal and Javal on the dependence of the concentration of urea in the blood on the level of protein intake.

We have carried out studies of two cases similar to the study made by Widal and Javal, but in addition we have studied the state of the urea excretion function, at various levels of protein metabolism, by the index of urea excretion previously described.[3] The findings of Widal and Javal have been duplicated, and their conclusions confirmed, and we have shown that the state of the function of urea excretion remained unchanged during the experiments, though great changes in the concentration of urea in the blood were observed.

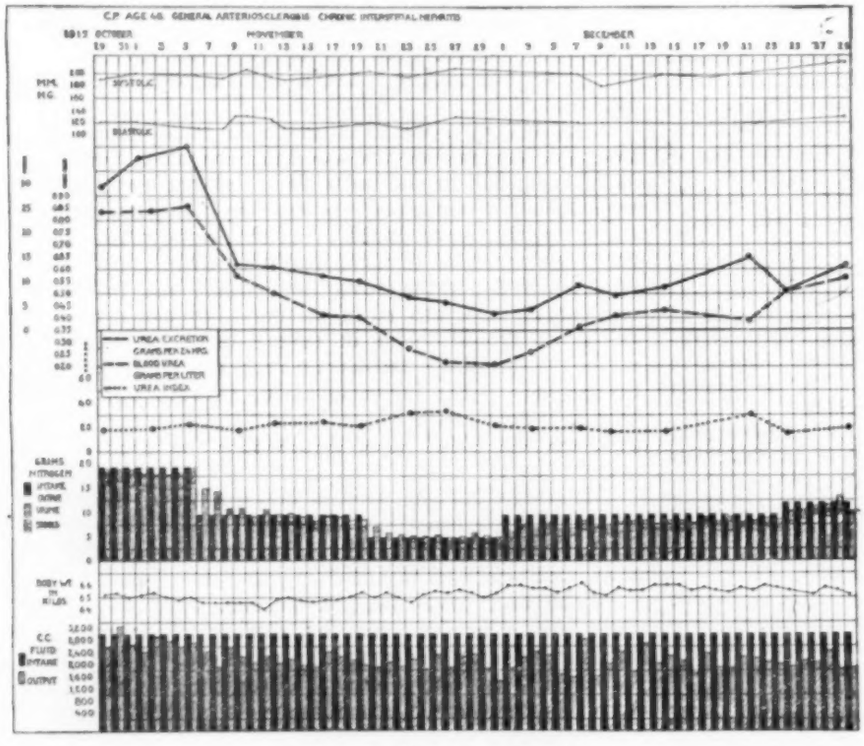

Chart 1.—Findings in Case 1.

METHODS OF OBSERVATION

The two patients studied had chronic nephritis, and were selected on account of an impairment of the function of urea excretion. Both were able to excrete large amounts of urine. They were both ambulatory patients, bore the strict dietary regimen well, and showed no change in general condition at the end of the experiment. Both are still alive, more than a year after the conclusion of the experiments, and are in practically the same condition as at that time.

On account of the length of the experiments, the diet was varied more than is usual in metabolism experiments, but strict analysis was made of the protein-containing foods. The chlorid and fluid intake were kept constant. Urine and stools were collected in twenty-four hour periods and analyzed daily for nitrogen. Blood urea was determined about twice a week, with a simultaneous urine analysis on a carefully timed specimen, in order to compute the index of urea excretion.[4]

The chief findings included in the two studied are given in the accompanying charts illustrating the two cases.[5]

REPORT OF CASES

Case 1.—C. P., man, aged 48, with general arteriosclerosis and chronic interstitial nephritis, first admitted to the hospital, Sept. 14, 1915, and kept under observation until June 5, 1916, complained of general weakness and loss of weight, which had been progressing for four or five years. There was found an advanced grade of general arteriosclerosis. The urine was clear, straw-colored and neutral; the specific gravity was 1.011. There was a heavy trace of albumin, but no sugar. Hyaline and finely granular casts were present, but not in large numbers. No red blood cells were found. The total elimination of phenolsulphonephthalein was 30 per cent. in two hours, September 15. Chart 1 shows the principal findings during a period of observation from October 26 to December 29.

Case 2.—W. F., boy aged 17 years, with chronic interstitial nephritis and aortic and mitral insufficiency, admitted to the hospital, March 27, 1916, seemed quite well, but was brought to the hospital on account of albuminuria. This had been discovered about one year before, after a brother aged 18 years had died suddenly of uremia. The patient had had three attacks of rheumatism, six, four and two years before. Following the last attack he had heart failure, with edema of both legs. No history of scarlet fever, measles or diphtheria was obtained. On examination there were found the physical signs of mitral insufficiency, but there were no signs or symptoms of heart failure. The urine was clear, straw-colored and acid; the specific gravity was 1.012. There was a heavy trace of albumin and no sugar. The sediment contained hyaline casts, leukocytes, and occasional red blood cells. Chart 2 shows the principal findings during a period of observation from March 28 to June 11.

COMMENT

The two cases are exactly similar. Both show the essential features described by Widal and Javal in their case; that is, a close parallelism between nitrogen intake, concentration of urea in the blood, and nitrogen output. A change in nitrogen intake was

4. The index of urea excretion is computed from the concentration of urea in the blood, the rate of urea excretion, the concentration of urea in the urine, and the weight of the patient, according to the following formula:

$$\text{Index of Urea Excretion (I)} = \frac{8.96 \times D\sqrt{C}}{Wt. \times Ur^2}$$

D, gm. of urea excreted per 24 hours;
C, gm. of urea per liter of urine;
Ur, gm. of urea per liter of blood;
Wt, body weight of individual, in kilograms. For further details consult the description of the index in previous papers.

5. Complete data in regard to the two cases here illustrated are given in a paper to be published in the Journal of Experimental Medicine, July, 1917.

always followed quickly by a change in the concentration of urea in the blood and in nitrogen output, so that nitrogen balance was reestablished on the new level. In Case 2 there were produced extremely wide fluctuations in the concentration of urea in the blood, from a minimum of 0.262 gm. per liter to a maximum of 2.542. This maximum is far above the level at which Hewlett, Gilbert and Wickett[6] believe that toxic effects of urea appear. It would seem that this patient, having suffered for some time with chronic nephritis, should have shown uremic symptoms, if these symptoms are in any way referable to an increased amount of urea in the blood and tissues. As a matter of fact, no effect was noted beyond an increased fluid output, a slight loss in weight, and increased thirst.

The findings regarding urea excretion are of especial interest. In Case 1, with a variation in blood urea concentration from a minimum of 0.211 gm. per liter to a maximum of 0.855 gm., the index of urea excretion remained remarkably constant. In eighteen observations, with an average of 21.4, a figure below 16.4 is noted only once, and above 26.4 only three times. These variations must be regarded as insignificant when the complexity of the formula and the possibility of error in the various determinations are taken into account. In Case 2 there is a somewhat greater range of variation. The most significant variation is that seen June 2, when the blood urea reached 2.542 gm. per liter. On this day the urea index was 8.3 instead of about 20. It would seem that here the maximum capacity of the kidneys to excrete urea had been exceeded and actual accumulation had begun. This occurred, however, only when the nitrogen intake had been maintained at over 36 gm. per day for two days.

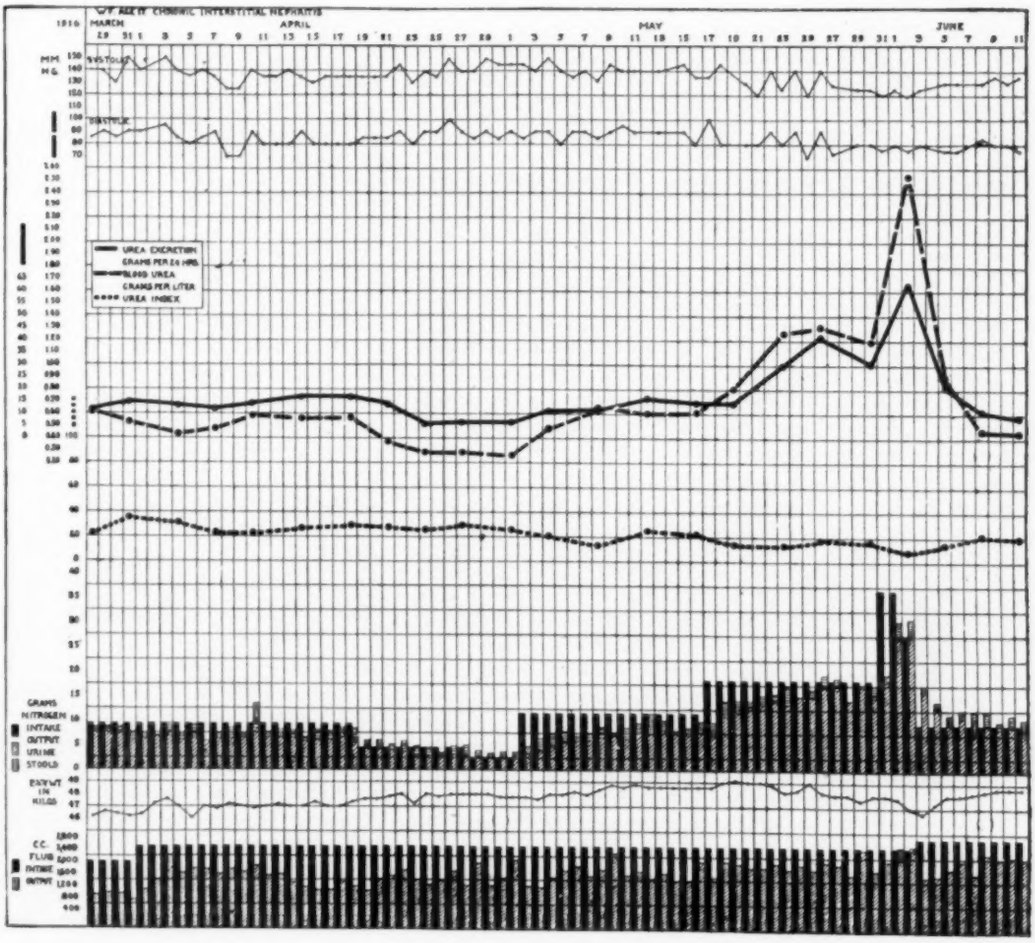

Chart 2.—Findings in Case 2.

It has been demonstrated, therefore, that a relatively increased concentration of urea in the blood follows the increased resistance with which diseased kidneys oppose the passage of urea. When, as the result of feeding an increased amount of nitrogen, the concentration of urea in the blood rises, a parallel increase in the rate of excretion of urea occurs. When a point is reached at which the rate of urea excretion is kept equal to the rate of formation by the organism, the level of urea in the blood ceases to rise, and the organism remains in nitrogen equilibrium. But when the nitrogen intake in the individual is diminished, urea is excreted for a time more rapidly than it is formed, until the level of urea in the blood falls, and reaches a point such that the rate of urea excretion is again equal to the rate of urea formation, and the organism is once more in nitrogen equilibrium. This experiment illustrates the events occurring in the so-called retention of urea.

SUMMARY

The two cases confirm the findings of Widal and Javal, and add the fact that no essential variation in the ability of the kidneys to respond to even high concentration of urea in the blood at various levels of protein metabolism was demonstrable, until a very high level was reached; that is, the quantitative relationship that existed between the concentration of urea in the blood and the rate of its excretion remained the same at all levels of protein metabolism.

CONCLUSIONS

1. Urea retention in the sense of a relatively increased concentration in the blood is the result of increased resistance to the excretion of urea through the kidneys.

2. The relatively increased concentration of urea in the blood overcomes the increased resistance to

6. Hewlett, A. W.; Gilbert, O. O., and Wickett, A. D.: The Toxic Effects of Urea on Normal Individuals, Arch. Int. Med., November, 1916, p. 636.

excretion, and the organism is thereby maintained in nitrogenous equilibrium.

3. The laws formulated by Ambard in regard to urea excretion apply in the condition of urea retention under a widely varying range of conditions, as to nitrogen intake and excretion.

4. The numerical value of Ambard's constant changes in urea retention, but the relation of the variable factors to one another remains otherwise unchanged.

5. The occurrence of a high concentration of urea in the blood is not necessarily accompanied by any symptoms suggestive of uremia.

DIETETIC TREATMENT OF NEPHRITIS

CONTROLLED BY CHEMICAL EXAMINATION OF THE BLOOD *

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It has long been recognized that the regulation of the diet is a very important part of the treatment of nephritis. The exact direction which such regulation should take depends on the form of involvement of the diseased kidney. In parenchymatous nephritis, where the normal elimination of water and salt is impaired, dietary restriction of these substances is designed to reduce the tax on the kidney to the lowest terms. The planning of the diet presents no special difficulties, since water is limited by excluding beverages and other fluid foods, and the chlorin intake is greatly reduced by the simple expedient of not adding salt to the food served to the patient and not including in the ration certain vegetables known to be conspicuously high in this element, such as lettuce and celery. The daily requirement for chlorin is very small, and the chief point to be emphasized is the maintenance of the patient's strength by an adequate energy supply. In interstitial nephritis the most characteristic phenomenon is the lowered permeability of the kidney for the nitrogenous constituents of the urine. The more protein there is in the diet, the more these substances accumulate in the blood, overtaxing the kidney and causing intoxication of the whole organism. Hence, the first dietary consideration in these cases is limitation of the nitrogen intake.

The present investigation has been conducted with persons suffering from interstitial nephritis. As already pointed out,[1] the intensity of this disease can be very accurately ascertained by estimating the amounts of the uric acid, urea and creatinin in the blood. The blood of normal persons before breakfast, on a moderate protein intake, contains approximately from 1 to 3 mg. of uric acid, from 12 to 15 mg. of urea nitrogen and from 1 to 2 mg. of creatinin per hundred c.c. of blood. If the blood analyses show a very appreciable excess over these figures, defective kidney function is suggested, while a considerable increase in these nitrogenous waste products is positive evidence of interstitial nephritis. Reliable methods for the determination of these substances in the blood have recently been devised. With these methods a comparatively large amount of data has been accumulated in our laboratory, and it would seem that we have ample reason to trust blood analyses for diagnosis, prognosis and guidance in treatment of these cases of nephritis. As has been pointed out by Myers,[2] only advanced cases of interstitial nephritis show high values for the blood creatinin, thus lending valuable prognostic significance to this test. Creatinin, being almost exclusively of endogenous origin, is less influenced by the intake of protein than is urea, and constitutes the most satisfactory criterion as to the deficiency of the kidneys and the most reliable means of following the course of the disease, while urea, being largely of exogenous origin, is more readily influenced by dietary changes and constitutes a most sensitive index of the response to treatment.

The accumulating urea of nephritis is chiefly derived from the protein ingested, and the first consideration in planning the daily rations for a nephritic becomes the restrictions of his protein allowance. For short periods in chronic cases or for tiding over a crisis, simple starvation may be practiced or the customary lemonade and sugar diet employed, but eventually the patient will be weakened by such a treatment and his chances of improvement and recovery diminished. The actual minimum protein requirement of man is not very high, and in the early stages of the treatment, the nitrogen intake should be as little in excess of this as circumstances will permit. Men at severe muscular labor have been maintained in nitrogen equilibrium for months on from 0.5 to 0.75 gm. of protein per kilogram of body weight per day.[3] This means that a mature man of average size need not consume more than 40 gm. of protein a day, and under stress of circumstances can get along on less. The exact amount of protein required varies with circumstances. With an increase of total fuel, the level on which protein metabolism can be maintained is proportionately lowered. This is due to the well known "protein-sparing" effect of carbohydrates and fats, a principle generally applied in agricultural practice in milk and beef production. For this reason a lemonade and sugar diet is better than simple starvation.

Another significant factor in the total nitrogen requirement is the chemical constitution of the individual proteins which enter into the food supply. Osborne[4] has made an extensive study of the vegetable proteins, and has found that these differ markedly in the number and proportions of the amino acids which compose them. Osborne and Mendel,[5] using isolated pure proteins in feeding experiments, have made some very significant discoveries, establishing definitely that each kind of protein has a value in nutrition dependent on the number and proportions of amino acids found in it; thus the absence or deficiency of lysin renders

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* From the Department of Medicine and the Laboratory of Pathological Chemistry, New York Post-Graduate Medical School and Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Chace, A. F., and Myers, V. C.: The Value of Recent Laboratory Tests in the Diagnosis and Treatment of Nephritis, THE JOURNAL A. M. A., Sept. 23, 1916, p. 929.

2. Myers, V. C., and Lough, W. G.: The Creatinin of the Blood in Nephritis: Its Diagnostic Value, Arch. Int. Med., November, 1915, p. 536.

3. A minimum nitrogen requirement has been determined in a number of laboratories. The work of Hinhede and his co-laborers may be specially mentioned. This work is compiled in a table by Rose, M. D. S.: Jour. Biol. Chem., 1917, **30**, 202.

4. Osborne: The Vegetable Proteins, London, 1909; Abderhalden's Biochemisches Handlexicon, Berlin, 1911, **4**, 1-52; 1914, **9**, 1-11; Carnegie Institute of Washington, 1907, Pub. 84.

5. Osborne and Mendel: Carnegie Institute of Washington, 1911, Pub. 156. Mendel, L. B.: Nutrition and Growth, THE JOURNAL A. M. A., May 8, 1915, p. 1539.

the protein inadequate for the support of growth; the absence of trytophan makes it incapable even of maintaining the adult organism. Such incomplete proteins must be supplemented either by the lacking amino acid or by another protein whose amino acid content is such as to supply the missing constituent. The foods as we eat them contain more than a single kind of protein. An inadequate protein may be supplemented in a satisfactory fashion by another in the same foodstuff, or it may require the addition of something not represented in that particular food material. Feeding experiments on growing animals conducted in a manner similar to those of Osborne and Mendel, but with single foodstuffs instead of isolated proteins, reveal the possible disastrous consequence of monotony in the diet if the proteins in the food are incomplete.[6] Thus oats, as the sole source of protein in a diet otherwise adequate, will not support growth in young animals, but the addition of casein renders the oat ration satisfactory. Casein is a protein of high biologic value, excelled in efficiency only by lactalbumin. Gelatin, on the other hand, has a very low value when used alone, being unable to support either the young or adult organism. However, McCollum[7] reports that it takes less gelatin to supplement a given amount of oats satisfactorily than it does of casein. In our present state of knowledge it is unsafe to predict as to the biologic efficiency of any untested combination of proteins in food. Even the highly regarded navy bean has been shown by McCollum[8] to be deficient in capacity to sustain the nitrogen metabolism, as evidenced by stunted growth of young animals fed on diets in which beans are the sole source of protein. It would seem prudent to consider that our nutritional safety lies in the use, in a restricted ration, of proteins whose efficiency has been well demonstrated, as those of milk, eggs or meat, or in a *variety of proteins* from vegetable sources, preferably combined with milk proteins.

TABLE 1.—OUTLINE OF DIETS*

Morning	Noon	Evening
Citrus fruit Cereal: Farina, oatmeal or banana Cream Toast Beverage	Cream soup: Plain, rice, celery, asparagus, spinach Chief vegetable: White potato, baked or mashed with butter, sweet potato, banana Lettuce salad with oil Cocoa	Rice, steamed, with cream or baked banana, or as pudding Cornstarch blanc mange and cream Banana Milk

* Other food may have been included in this outline, and of those included, not all are to be considered on a par. Farina should be given more often than oatmeal. Of the soups, the plain soup or cream of rice or potato are preferable, but to break the monotony celery or asparagus may be served on rare occasions. In green vegetables the spinach and string beans are the best and the other two listed to be used as an occasional indulgence.

In recent years we have also come to realize that the mineral metabolism is a very important factor in nutrition. McCollum[9] fed young animals a diet of corn and purified casein, and found that they soon ceased to grow. When a suitable salt mixture was added, they made rapid progress and soon attained normal weight for their age. Wheat, oats and beans have also been shown to require some adjustment of their ash content before they will support normal growth.

In monotonous feeding of single kinds of food or a limited number of foods of certain types, pathologic conditions set in which are due to other factors than inadequacy of protein or mineral content. These are attributed to minute quantities of certain organic substances known as food accessories or vitamins. McCollum[10] has shown that there are two substances required for growth, one soluble in water, the other associated with the ether-soluble fraction of the food. Besides these we have a third accessory whose absence manifests itself by the symptoms of scurvy. A liberal variety of fruits and vegetables eliminates the danger of omitting this element of an adequate diet.

In feeding animals, excellent results can be obtained from a simple monotonous dietary, provided all the essentials of a well-balanced ration are represented, that is, a full energy supply, protein and ash in suitable kinds and amount, sufficient ballast, and food accessories. In feeding the human subject, there are also psychologic considerations which cannot be altogether disregarded, and some provision must be made for variety to secure the best results. Our work has been based on the assumption that the patient should be given a minimum amount of medication, and kept at rest and as cheerful and contented as circumstances permit. As the meals are generally the patient's chief diversion, they should be made agreeable and interesting by suitable variety in choice of food and manner of serving.

The food should supply the full quota of nutrients for a person at rest, while the load on the kidney should be reduced as much as is compatible with physiologic well-being. The average man, at rest, will require about 2,000 calories per day. Nephritics, without edema, do not differ from normal persons in their fuel requirement.[11] In severe cases the protein intake should be placed low at first, not exceeding 30 gm. per day. Later it may be raised to 50 or 60 gm. The diet has been salt-free in the sense that it includes only the sodium chlorid naturally occurring in the food materials used; none has been added for seasoning

TABLE 2.—DISTRIBUTION OF MINERAL ELEMENTS IN SOME HIGH AND LOW PROTEIN FOODS*

Food	Protein, per Cent.	Calcium, per Cent.	Phosphorus, per Cent.	Chlorin, per Cent.	Iron, per Cent.	Ash Balance in Terms of Normal Solution, C.c.
Asparagus	1.8	0.029	0.039	0.040	0.0010	Base 0.81
Bananas	0.4	0.007	0.024	0.200	0.0006	Base 5.6
Butter	1.0	0.014	0.013	0.00X		
Carrots	1.1	0.055	0.044	0.036	0.0008	Base 10.8
Celery	1.1	0.071	0.044	0.170	0.0005	Base 7.8
Citrus fruit	0.5	0.036	0.017	0.010	0.0004	Base 7.0
Lettuce	1.2	0.036	0.039	0.050	0.0010	Base 7.4
Potatoes, white	2.2	0.011	0.061	0.030	0.0013	Base 7.7
Potatoes, sweet	1.8	0.018	0.039	0.120	0.0005	Base 6.9
Prunes, dried	2.1	0.043	0.011	0.010	0.0029	Base 25.6
Raisins, dried	2.6	0.057	0.123	0.070	0.0050	Base 23.7
Spinach	2.1	0.064	0.057	0.010	0.0032	Base 27.1
Cream (18.5%)	2.5	0.100	0.079	0.100	0.0002	Base 1.3
Milk	3.3	0.121	0.095	0.120	0.0002	Base 1.8
Barley pearl	8.5	0.018	0.200	0.020	0.0013	Acid 10.3
Corn meal	9.2	0.011	0.142	0.020	0.0011	Acid 3.7
Oat meal	16.7	0.093	0.381	0.035	0.0036	Acid 10.6
Rice	8.0	0.009	0.087	0.050	0.0009	Acid 8.4
Rye flour	6.8	0.050	0.329	0.020	0.0040	
Wheat flour	11.2	0.019	0.081	0.070	0.0015	Acid 9.6

* The data from which this table has been compiled are taken largely from Sherman: Chemistry of Food and Nutrition, New York, 1912.

6. McCollum, E. V.: The Supplementary Dietary Relationships Among Our Natural Foodstuffs, THE JOURNAL A. M. A., May 12, 1917, p. 1379.
7. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1917, **29**, 343.
8. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1917, **29**, 521.
9. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1916, **28**, 154.
10. McCollum, Simonds and Pitz: Jour. Biol. Chem., 1917, **30**, 13.
11. Aub, J. C.; Du Bois, E. F., and Soderstrom, G. F.: Respiratory Metabolism in Nephritis, Arch. Int. Med., May, 1917, p. 865.

purposes.[12] The meals have been selected as to insure the adequacy of the protein, ash and food accessories.

The general plan of the dietary is as follows: A warm, cooked cereal, generally farina served with milk, is given for breakfast. This is sometimes replaced by oatmeal or a baked banana, and toast and a citrus fruit are occasionally added. The noon meal consists of a plain soup made from milk, flour and butter, given mainly to supply an agreeable hot dish, though it is also utilized as a medium for introducing variety, by adding celery, asparagus or spinach; a main dish consisting of baked potato, now and then replaced by baked half-ripe banana and steamed rice; a liberal portion of green vegetable and a lettuce salad with oil dressing, flavored with lemon or vinegar. The evening meal is composed of such articles as ripe bananas, rice pudding, cornstarch blanc mange, steamed rice with baked bananas and stewed fruit. Milk and cocoa in limited quantities are served as beverage. This general plan is outlined in Table 1. From this outline some twenty diets have been prepared. These diets have been used in our experimental work, and for this reason have been given more monotonously than would ordinarily be required or desirable. By careful arrangement they can be made to furnish considerable variety without unduly taxing the cuisine of a hospital or sanatorium. No dietary program of this sort should be considered as fixed, but made sufficiently elastic to meet the market conditions and, what is more important, the patient's digestive conditions. It seems to be a common experience that the nephritic patient is particularly susceptible to gastro-intestinal disturbances, and the dietary should irritate the alimentary tract as little as possible. The individual's peculiarities and gastro-intestinal conditions are to be considered in prescribing a diet.

TABLE 3.—THE FIRST TWO DIETS FOR SEVERE CASES

Juice from 1 lemon, Serve 4 times a day
¾ cup water,
6 tablespoons lactose.
(1 tablespoon cane sugar)
Calories 1,424 Ash alkaline Iron, 0.8 mg.

Morning	Noon	Evening
Banana..... 300 gm.	Cream soup 200 c.c.	Banana..... 300 gm.
Cream..... 100 c.c.	Banana..... 300 gm.	Cream..... 100 c.c.
Cocoa..... 200 c.c.	Milk..... 200 c.c.	Cocoa..... 200 c.c.

Calories, 1,585 Protein, 35.4 gm. Ash, alkaline, 15.6 n. Iron, negl.

TABLE 4.—HOW MENUS ARE CONSTRUCTED FROM TABLE 1*

Morning	Noon	Evening
One half orange	Cream of asparagus soup..... 200 c.c.	Banana, ripe.. 400 gm.
Oatmeal..... 200 gm.	Potato, baked and mashed with butter (50 gm.)..... 200 gm.	Milk..... 240 c.c.
Toast, butter. 1 slice	Green vegetable, spinach	or
Cream, 18.5%.. 50 c.c.	Milk..... 200 c.c.	Cornstarch blanc mange. 200 gm.
Milk..... 100 c.c.		Cream..... 50 c.c.
		Bread and butter..... 33 gm.
		Cocoa..... 200 c.c.

Between meals, 1 slice buttered toast and 200 c.c. cocoa

Calories, 2,348 Protein, 53 gm. Alkaline, ash, approx. 50 n
Iron, over 15 mg.

Cream of wheat..... 150 gm.	Cream of celery soup..... 200 c.c.	Banana..... 400 gm.
Banana..... 200 gm.	Baked potato..... 200 gm.	Steamed rice.. 100 gm.
Bread and butter..... 33 gm.	Butter..... 1 tbsp.	Cream, 18.5%.. 100 c.c.
Cream..... 100 c.c.	Spinach.....liberal portion	Milk..... 200 c.c.
	Cocoa, ½ milk..... 200 c.c.	

Calories, 2,085 Protein, 39.7 gm. Ash, alkaline, 86 n. Iron, 15.5 mg.

* The recipe for the lemonade in Table 3 and the data for this table are taken from Rose, M. D. S.: Feeding the Family, New York, 1916, and Laboratory Hand-Book of Dietetics.

12. In nephritis, when there is no tendency to edema, the salt restriction need not be so severe.

TABLE 5.—BLOOD FINDINGS IN INTERSTITIAL NEPHRITIS*

Date, 1915	Creatinin, Mg. per 100 C.c. Blood	Urea Nitrogen, Mg. per 100 C.c. Blood	Remarks
February 24	8.3	55	Standard parenchymatous diet
March 1	6.5	63	
March 6	5.3	89	
March 19	6.5	51	
March 25	6.1	51	
April 8	8.0	61	
April 16	11.0	144	

* J. W., aged 34; sickness fifteen months prior to admittance to hospital; edema, nausea, vomiting, constipation; blood pressure, 222-122; albuminuria, casts; phenolsulphonephthalein test, 2 per cent.

The diet scheme includes grains (seeds), tubers and stems (including leaves) of plants, and therefore supplies all necessary food accessories or vitamins.[13] Several kinds of plants are drawn on, and these, together with the amount of milk allowed, will insure the supplementing of all the proteins of low biologic value. Greens are liberally supplied, in part, to furnish fiber for ballast, but more for the important mineral matter which they carry. In many instances the patient's stomach is sensitive to these vegetable foods when fed in natural form, as they should normally be consumed and it becomes desirable to purée them. When constipation results from too little inert matter in the food, liquid petrolatum is prescribed in

TABLE 6.—BLOOD FINDINGS IN INTERSTITIAL NEPHRITIS*

Date, 1915	Creatinin, Mg. per 100 C.c. Blood	Urea Nitrogen, Mg. per 100 C.c. Blood	Remarks
January 22	7.8	60	1,200 c.c. lemonade
January 27	10.0	67	Cereal (200 gm.); bread and butter, 5 slices; potato; cocoa (400 c.c.)
January 30	8.9	77	
February 6	8.4	72	Same diet plus 240 c.c. cream soup, 2 glasses milk, matzoh, sugar and syrup
March 9	11.0	97	
March 16	11.4	120	Patient given free choice as to diet
March 19	14.1	131	
March 23	20.5	152	

* T. D., aged 34; sickness six months prior to admittance to hospital; eyesight impaired, epigastric pain, nausea; blood pressure, 225-130; small amount of albumin in urine; casts; phenolsulphonephthalein test, 2.2 per cent.

TABLE 7.—BLOOD FINDINGS IN INTERSTITIAL NEPHRITIS*

Date, 1916	Creatinin, Mg. per 100 C.c. Blood	Urea Nitrogen, Mg. per 100 C.c. Blood	Remarks
February 11	8.5	55	Standard interstitial nephritic diet
February 18	11.9	60	
February 23	12.5	76	
March 3	11.4	74	
March 7	10.4	60	
March 28	10.8	48	Standard parenchymatous diet
March 31	9.6	45	
April 7	9.5	39	
April 14	8.2	34	
April 25	10.0	45	
April 28	10.0	43	
May 10	11.4	56	Lemonade
June 9	9.6	68	

* W. W., aged 30; edema, poor eyesight, polyuria, heart displacement; blood pressure, 208-155; pronounced albuminuria; hyaline casts; phenolsulphonephthalein test, 1 per cent.

13. McCollum (Footnote 6); McCollum, Simonds and Pitz (Footnote 10).

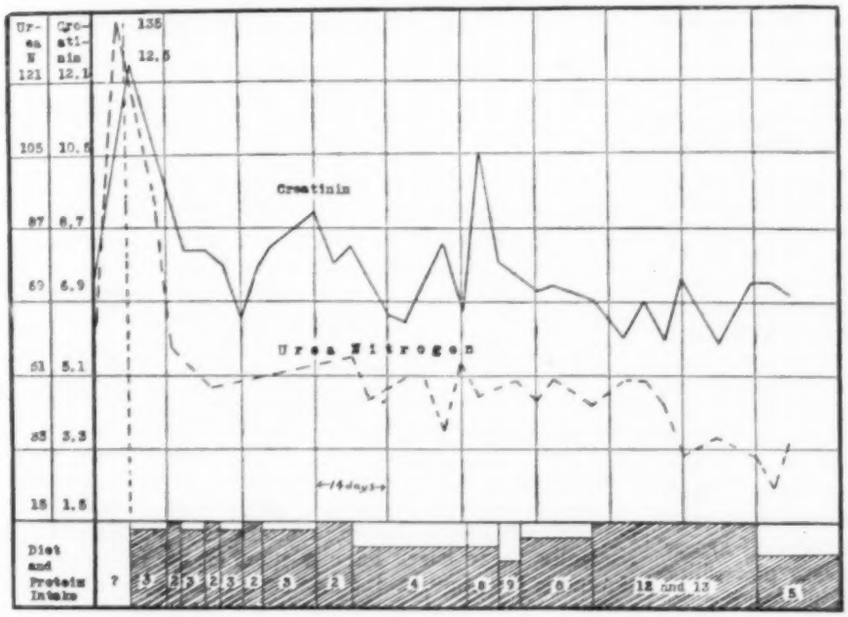
preference to salts or other drugs. The distribution of the ash elements in the vegetable foods is indicated by Table 2, and the desirability of the inclusion of greens is emphasized. The most conspicuous food element supplied by these is the iron. This substance is particularly needed in abundance to help diminish the anemic condition so conspicuous in these cases. Normally, an adult's requirement is reckoned at 15 mg. per day,[14] and nephritis certainly should not have less. Another characteristic of interstitial nephritis is a tendency to acidosis. Besides having a sufficient amount of ash constituents present, these should be so grouped quantitatively that their reaction does not aggravate, but, as far as possible, tends to neutralize the acid condition. Sherman[15] and his co-workers have made a study of the reaction of the food ash, and the last column of Table 2 is compiled from data which they have gathered. It is to be noted that roots, tubers, stems and pericarps, grouped at the top of the table, are predominately alkaline, whereas the seeds, grouped at the bottom, are strikingly of the opposite reaction, due to their higher phosphorus content and the sulphur from their abundant protein. The diet should, therefore, be arranged to contain more of the former than of the latter.

TABLE 8.—RECENT CASES OF INTERSTITIAL NEPHRITIS

Patient	Date, 1917	Creatinin, Mg. in 100 C.c.	Urea Nitrogen, Mg. in 100 C.c.	Remarks
H. G. Aged 21	May 9	4.9	45	Gastric symptoms, first diagnosed as peptic ulcer
	May 15	3.0	45	
	May 18	4.6	39	Placed on diet consisting mainly of cooked cereals, milk toast, cocoa, and occasionally banana; phenolsulphonephthalein test 5/18, 37%
	May 22	3.1	26	
	May 25	2.6	30	
	May 29	5.7	70	
	June 1	4.7	60	
	June 8	3.3	48	
	June 15	2.5	23	
J. W. C. Aged 60	April 24	2.8	38	Kept on diets similar to Table 4 with a protein intake not over 52 gm.; phenolsulphonephthalein test, 5/18, gave an elimination of 8.7 %
	May 1	2.1	35	
	May 8	6.1	41	
	May 15	5.2	30	
	May 22	3.3	28	
	June 1	3.1	36	
	June 8	4.5	26	

H. G., pain in umbilical region; no nephritic symptoms; loss of weight; anorexia; blood pressure, 135-80; trace of albumin in urine; few casts; phenolsulphonephthalein test, 35 per cent.

J. W. C., asthma; nocturnal dyspnea; edema; polyuria; blood pressure, 190-90; small amount of albumin in urine; few casts; phenolsulphonephthalein test, 9 per cent.



Influence of the diet on the creatinin and urea in the blood in J. B., man, aged 34.

The diets, as planned, have a relatively high calcium content, desirable not only to meet the daily requirements for this element, but also to divert the elimination of phosphorus from the kidney to the intestine, as this element is sometimes eliminated with difficulty by an impaired kidney. Phosphorus is strikingly essential in cell life and its absolute restriction for a protracted period would hardly seem wise. But since the elimination of the phosphorus is not confined to the kidney, occurring also by way of the intestine in the form of dicalcium and tricalcium phosphate, appreciable amounts of the phosphate intake may be shifted from the kidneys to the intestine by having an alkaline ash rich in calcium.[16] In this connection it is needless to suggest that for such cases the bread supplied should not be raised by phosphate baking powder.

In severe cases it is well to begin the dietary treatment with a ration that is free from protein, such as lemonade, and follow this with a mild food easy to take and low in protein. Ripe bananas have been found very serviceable for this purpose. Lemonade and banana diets are shown in Table 3. In the lemonade the sugar is added more for sweetening than for its calories, and may well be replaced, wholly or in part, by lactose, which is to be preferred to sucrose, in that it is apt to be less irritating and will add materially to the fuel value of the ration. In ripe bananas we are fortunate in having a fruit which is mild in flavor and can, therefore, be taken in quantity for a number of days without creating aversion; it has also a high caloric value with very low protein content and an alkaline ash. Because of the small margin between its alkaline earths and phosphorus, it should be served with a little milk to increase the calcium. Table 4 shows how diets may be

TABLE 9.—FINDINGS IN INTERSTITIAL NEPHRITIS*

Date, 1916-17	Creatinin, Mg. per 100 C.c. Blood	Urea Nitrogen, Mg. per 100 C.c. Blood	Protein Intake	Diet
Dec. 22-26	7.4	61		
Jan. 5	9.7	125		
Jan. 9	12.5	110	49	Banana and milk
Jan. 12	11.1	110	49	The same alternated with Diet 2
Jan. 16-23	8.8	75	49-51	
Jan. 23-Feb. 6	7.5	50	49-51	
Feb. 9-20	8.4	54	49-51	
Feb. 23-27	7.7	53	49-51	
Mar. 2-9	6.7	50	49-51	
Mar. 13-16	7.4	45	49-51	
Mar. 20	10.6	46	40	Diet 4
Mar. 23-30	7.4	47	25-40	Diet 8-9
Apr. 13-17	6.4	45	52	Diet 12-13
Apr. 20-30	6.8	41	52	Diet 12-13
May 8-22	6.6	31	52	Diet 12-13
May 29-July 15	6.8	33		

* J. B., man, aged 34; edema, headache, dyspnea; blood pressure, 204-130; albuminuria, hyaline and granular casts; phenolsulphonephthalein test, 3 to 19 per cent.

14. Sherman: Chemistry of Food and Nutrition, New York, 1912.
15. Sherman and Sinclair: Jour. Biol. Chem. 1907, **3**, 307. Sherman and Gettler: Jour. Biol. Chem., 1912, **11**, 323.
16. Forbes and Keith: Ohio Agric. Exper. Sta., Tech. Series Bull. 5, p. 203, 1914.

constructed from Table 1. Bananas may with profit enter frequently into the subsequent diets; but bananas, if served raw, must be thoroughly ripe.[17] For convenience and economy, especially in an institution, it is desirable to purchase the fruit by the bunch. If, however, consumption is delayed until the bananas are fully ripe, some loss is apt to occur through the rapid ripening. Investigations in this laboratory afford convincing evidence that the bananas can be used with perfect success if they are cooked; hence use of a bunch may begin as soon as yellowing commences. This will tend to increase the variety of the diet, since they may be served warm. When baked, they have a distinctive texture and flavor, which further varies with the degree of ripeness.

The blood findings in three typical severe cases of interstitial nephritis are shown in Tables 5, 6 and 7. These patients were kept on monotonous low protein diets. It has hitherto been an almost invariable rule that patients with such unfavorable creatinin content in the blood have succumbed in comparatively short time. In Table 8 are given the most recent cases of advanced nephritis in this hospital. After the first week these patients have been kept on a dietetic system conforming to the ideas expressed in this paper. There has not been as prompt and favorable response to this treatment as one could wish, but the trend is in the right direction. A detailed study has been made of the case represented by Table 9 and the chart. This patient was in a very critical condition when he arrived at the hospital, with the creatinin and urea rising rapidly. He was placed on bananas and milk alternately every three days with cereal, potatoes, cornstarch and milk. There was an apparently immediate response as to urea, and a later response as to the creatinin. The patient was anemic, with a blood count of red cells of some 3,300,000 and hemoglobin at 55 per cent. These have since increased to 4,200,000 and 65 per cent., respectively. The physical condition of this patient is at present much improved. The figures in the table are in most instances averages. These, and the inclination of the curves, though not striking, are nevertheless encouraging, and although there is no immediate sign of arrest or recovery from the disease, it indicates a possibility of treatment which may well be of importance in earlier stages and milder cases. It is not strictly fair to draw conclusions as to mild cases from these severe ones, but in the former we have no such tangible means of noting progress. From the foregoing considerations and the findings of the blood analyses here reported, as well as the cases mentioned in a former paper,[17] we feel justified in thinking that a rational system of dietetics in cases of interstitial nephritis, which are not too advanced, may lead to a material reduction of fatal eventualities.

SUMMARY

A scheme of dietetic treatment for nephritis, based on the more recent advances in the field of nutrition, and tested in advanced cases of interstitial nephritis in this hospital, has had encouraging results thus far. The patients used in the test have been followed not only by the usual clinical observations at the bedside, but also by frequent chemical examination of the blood. The determination of creatinin and urea nitrogen affords an excellent and convenient means of gaging the kidney's capacity to eliminate nitrogenous waste products and noting the response of the nephritic to treatment. The plan provides a diet adequate in calories, protein, mineral elements and food accessories. To attain this, a variety in the menu has been insisted on. This insures a happier and more content attitude on the part of the patient, the inclusion of all the requisite vitamins and the complementing of biologically incomplete proteins. At least one hot dish is provided each day by giving a bowl of cream soup. Green vegetables are given to bring the iron intake in excess of 15 mg. per day. The sum total of the day's ash constituents should be decidedly alkaline in reaction and rich in calcium. Foods high in phosphorus are discriminated against, though not strictly barred, as are also foods of striking flavors. The day's energy requirement should add up to at least 2,000 calories, and the protein should not exceed 60 gm.

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17. Myers and Rose: The Nutritional Value of the Banana, THE JOURNAL A. M. A., April 7, 1917, p. 1022.

THE NATURE AND TREATMENT OF CHRONIC PARENCHYMATOUS NEPHRITIS (NEPHROSIS) *

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The term "chronic parenchymatous nephritis" is ordinarily applied to a variety of renal diseases which pathologically may be widely different in character. Thus cases of chronic diffuse nephritis, of amyloid kidney and of chronic nephrosis are grouped under a single heading. According to modern conceptions, chronic diffuse nephritis constitutes an inflammatory process involving all the kidney structures—glomeruli, tubules and interstitium; the other types represent degenerative processes, in one of which (chronic nephrosis), the lesion chiefly affects the tubules, and is not at all inflammatory.

The reason for the use of a single term in designating such distinct pathologic conditions is the fact that clinically these cases have a number of features in common: the oliguria, the intense albuminuria, and the edema. Certain diagnostic criteria have been established for differentiating one variety from another.[1] Thus in chronic nephrosis, it is said, the urine is free from formed blood elements and the blood pressure is not elevated. In practice a differentiation on these criteria is not always feasible; for cases are encountered in which the basic disturbance resembles that of chronic nephrosis, whereas in other respects the existing conditions do not fulfil the requirements of the classification.

It is stated also that, etiologically, chronic nephrosis differs from the other varieties in that its origin is obscure or unknown. It bears no definite relation to the known infectious diseases. The kidney of pregnancy is often cited as an example of this type of renal disease; and in view of the fact that certain anatomic peculiarities in diseased kidneys are characteristic of different causes, it is surmised that the degenerative process in the kidneys in this affection is due to an

* From the service of Dr. N. E. Brill.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Volhard and Fahr: Die Brightsche Nierenkrankheit, Berlin, Julius Springer, 1914.

intoxication, because of the similarity of the lesion to that produced by certain mineral poisons.

From a comprehensive study of the blood, of effusions, and of the urine, in this and other forms of renal disease[2] some light was gained concerning the morbid processes of this peculiar affection. In a series of 193 cases representing various renal conditions, which I have had occasion to observe in the past few years, the type of disease under discussion has been encountered in fifteen individuals. It appears from these observations that the pathologic and chemical basis of the cases now termed "chronic nephrosis" is that of a nutritional or constitutional disorder. Furthermore, the evidence acquired also points to the probability that certain cases of diffuse nephritis represent a form of renal disease in which some of the morbid phenomena correspond to those found in chronic nephrosis, whereas others are secondary to or associated with inflammatory changes in the kidneys.

The most striking phenomenon in this group of renal diseases is the intense and persistent albuminuria. The quantity of albumin excreted in the urine is often great. Its daily output for weeks and months may amount to as much as 50 gm. The source of the albuminous substances in the urine is the blood serum or plasma. In view of the fact that the total quantity of protein in the blood serum, in a normal individual of average weight and size, is approximately 210 gm., the daily loss incurred by the blood in this manner may constitute a large percentage of that present in the circulation.

Whether the excretion of these substances is due primarily to an altered protein utilization, or is the result of an unusual permeability of the renal epithelium, is a question which cannot be answered at the present time. The fact remains, that as a result of the intense and prolonged albuminuria, profound changes take place in the composition of the blood. The development of a state of malnutrition is evidenced by a number of facts. Whereas normally the blood serum contains from 6.5 to 8.3 gm. of protein to the hundred c.c., of which a little more than one third is globulin; in disease the quantity of protein may be much reduced and the globulins show a relative increase. The characteristic change in the blood serum in cases of chronic nephrosis is a reduction in the total protein content with a marked relative increase in the globulin, which in certain instances constitutes nearly all of the protein present.

TABLE 1.—TYPES OF COMPOSITION OF BLOOD SERUM IN CHRONIC NEPHROSIS

Total Protein Gm.	Incoag. Nitrogen Gm.	Per 100 Cc. Globulin Gm.	Per 100 Cc. Chlorid Gm.	Cholesterol Gm.	Globulin in Protein Per Cent.
3.611	0.065	2.038	0.404	0.760	59.0
2.731	0.101	2.598	0.390	1.226	95.0

A discussion of the causes which lead to this remarkable change in the blood serum must be left for another occasion. It is known that infections and intoxications of various sorts lead to an increase in the proportion of globulin in the blood. Hurwitz and Meyer[3] have found that the increase in globulins may result from the toxic action of infecting agents on the body tissues. On the basis of other changes which occur in the blood, such as the accumulation of fatty substances, the increase in the globulin content indicates a tissue disintegration. The quantity of fats and lipoids, which accumulate in the blood in this disease is extraordinary.[4]

In no other condition of renal disease are such changes in the blood serum encountered. What concerns other substances in the blood, namely, nonprotein nitrogen and the chlorids, it might be said that these often range within normal limits or may be slightly elevated. One reason for the low concentration of nonprotein nitrogen in the blood may be a large distribution of this constituent throughout the body in the edematous tissues. That this is so is illustrated by the following clinical observation:

> The blood of a patient suffering from a severe nephritis, with symptoms of impending uremia (visual disturbances, violent headaches, vomiting) and a generalized edema, was examined and found to contain 0.070 gm. of nonprotein nitrogen per hundred c.c. Ten days later, when many of the symptoms disappeared and the edema partly subsided, the blood contained 0.210 gm. of nonprotein nitrogen per hundred c.c. Finally two weeks after the second examination, when the patient was much improved and the edema had entirely subsided, the nonprotein nitrogen of the blood was 0.70 per hundred c.c.

It is usually stated that, in cases of chronic nephrosis, the urine may have a high specific gravity; that it may contain normal quantities of nitrogenous urinary substances, but that it is deficient in chlorids. According to Widal[5] this is one of the characteristic features of the disease.

In discussing the classification of this group of nephritic conditions, I stated that there are certain cases of diffuse nephritis in which some of the manifestations resemble those found in chronic nephrosis, while others are referable to inflammatory changes in the kidneys. Examples of this type are found particularly in two groups of conditions: first, during or after pregnancy, and second, in association with diabetes mellitus. The first occurs in relatively young women who, in the course or directly after a pregnancy, develop renal disease. I have had occasion to observe six cases of this type. Not only do such cases show evidence of malnutrition as proved by the changes in the blood, but they also indicate the occurrence of disturbances in certain of the internal secretions. As in the cases of chronic nephrosis, the albuminuria is very intense; but formed blood elements may occasionally be found. The urine is scanty and of varying specific gravity; it is deficient in chlorids and may also show diminution in the nitrogen output. The blood shows changes similar to those observed in chronic nephrosis; namely, the reduction in the protein content of the serum, the relative increase in the globulins and an excessive increment in fatty material. Extensive edema develops; notwithstanding this fact, the nonprotein nitrogen of the blood in these cases may be considerably elevated.

TABLE 2.—TYPES OF COMPOSITION OF BLOOD SERUM IN CHRONIC DIFFUSE NEPHRITIS (MILD AND SEVERE CASES)

Total Protein Gm.	Incoag. Nitrogen Gm.	Per 100 Cc. Globulin Gm.	Per 100 Cc. Chlorid Gm.	Cholesterol Gm.	Globulin in Protein Per Cent.
4.919	0.130	3.440	0.397	0.460	70.0
3.958	0.084	2.594	0.404	1.150	66.00

The blood pressure in the latter group of cases rises very high (240 mm. of mercury). The other clinical features which suggest a disturbance of the internal

2. Epstein, A. A.: Jour. Exper. Med., 1912, **16**, 719; 1913, **17**, 444; 1914, **20**, 334. Rowe, A. H.: The Albumin and Globulin Content of Human Blood Serum, Arch. Int. Med., September, 1916, p. 455.
3. Hurwitz and Meyer: Jour. Exper. Med., 1916, **24**, 515.
4. Epstein and Rothschild: Am. Jour. Pysiol., 1917, **42**, 586.
5. Widal: Jour. méd. français, 1911, **5**, 18.

secretions are the cessation of menses (in four out of six cases), or the development of menorrhagia; loss of hair, pigmentation of the face (light coffee brown), exophthalmos, and varying degrees of enlargement of the thyroid.

The kidney of pregnancy, as stated before, is believed to represent a typical example of nephrosis. The cases just mentioned stand in etiologic relationship to pregnancy, and from the character of the changes in the blood they resemble the cases of chronic nephrosis; but, unlike those, they show a high blood pressure. This circumstance, however, does not militate against the assumption that the intrinsic nature of the disturbance is similar to that of chronic nephrosis. The early cessation of the menses in the majority of the cases suggests that the rise of blood pressure may, to a certain extent, be the result of the associated disorder of the internal secretions, like that which occurs in the normal menopause.

The other pathologic condition, as stated before, with which this type of renal disease is sometimes associated is diabetes mellitus. I have observed three such cases, two of which occurred in men. The ages of the three persons were 52, 58 and 59 years, respectively. In two of the cases the glycosuria and the albuminuria were discovered at the same time. In the remaining one, the albuminuria antedated the diabetes by three years. In these cases, some of the clinical findings differed from those of the preceding group.

While the glycosuria was present, the quantity of urine excreted was very large, from 4 to 6 liters a day. The albuminuria was intense and the specific gravity of the urine varied largely with the amount of sugar excreted. The chlorid and nitrogen elimination was high while the glycosuria lasted. In two of the cases, a subsidence of the glycosuria caused a moderate reduction in the polyuria, and a marked fall in the specific gravity. The chlorid and nitrogen elimination also became diminished. In the third case, cessation of the glycosuria caused a reduction of the polyuria and finally normal quantities of urine were eliminated, the specific gravity of which was normal.

In consequence of the polyuria, the edema in these cases was insignificant. Puffiness of the eyelids and a slight swelling of the feet was all that could be observed. Elevated blood pressure was present in all. In the two cases with persistent polyuria, the blood pressure ranged between 220 and 250 for a period of over two years. In the third case, while the glycosuria lasted, the blood pressure was 170 and over; control of the glycosuria, however, brought the blood pressure down to 130 mm.

Blood analysis in these cases showed changes similar in character to those already described, but of less degree. There was a reduction of the protein with a predominance of globulin; the lipoids were also high. Nonprotein nitrogen was not elevated in two cases during the glycosuric period; subsequently it rose progressively until uremic coma set in. In the third case, no rise in the nonprotein nitrogen was observed at any time.

That both the ordinary nephrosis and the special type of diffuse nephritis just described are associated with profound nutritional disturbances is supported by the recent studies of Aub and Du Bois.[6] These authors find that in cases of nephritis with marked edema, the general metabolism is much reduced. On the other hand, in nephritic patients without edema, there is no reduction in metabolism. In contrast to this, edematous cardiac patients, as a rule, show an increased metabolism.

From a consideration of the facts presented, it seems probable that the morbid processes in chronic nephrosis and in some special cases of chronic diffuse nephritis represent a general constitutional disturbance, and not merely a disease restricted entirely to the kidneys. No other variety of renal disease gives rise to such changes as those found in this group of cases.

Barring the special cases in which renal disease and diabetes coexist, another striking clinical manifestation in this group of cases is the edema. According to Widal,[5] whose views are now generally accepted, the edema is the result of a failure on the part of the kidneys to eliminate salt and water. On a previous occasion,[7] I discussed the question of the causation of edema, and offered evidence in support of the view that the retention of salt and water is not necessarily the result of a disturbed elimination of these substances by the kidneys. The forces which prevent their excretion are extrarenal. The hypothesis is briefly this:

The loss of protein incurred by the blood serum through the continuous albuminuria causes a decrease in the osmotic pressure of the blood. Through this condition and the additional circumstance that large quantities of fats and lipoids accumulate therein, the physicochemical state of the blood is disturbed to such an extent that it loses much of the power which it normally possesses to withdraw fluids from the tissues. Consequently deposition of fluid in the tissues occurs. In other words, the edema in this type of nephritis is not necessarily the result of a lessened permeability or diminished functional power of the kidneys to eliminate salt and water, but is the result of a change in the character of the blood. It is noteworthy that the edema fluid in these cases, unlike that present in any other condition, is composed almost exclusively of inorganic and nitrogenous salts and water.[8] The view here presented is amply supported by experimental and clinical facts.[9]

In considering the treatment of the types of cases presented here, it is essential to remember that conditions of nutritional disturbance are present; that the retention of fluid and the edema which develops are closely associated with definite changes in the blood. The object of the treatment must therefore be primarily to overcome the disturbed condition of the blood and to improve nutrition. The methods heretofore practiced in the management of such cases have been rather ill calculated to improve the nutritional state of the patients. Aub and Du Bois,[6] in the investigations referred to, find "that the edematous nephritics, kept on low diets, show a reduction in food requirements similar to that found usually in prolonged undernutrition. Other nephritics have approximately the normal food requirement." The degree of wasting, from which the patients described suffer, becomes evident only after the edema subsides and they improve otherwise, for they are often reduced to a condition of skin and bones.

6. Aub, J. C.; Du Bois, E. F., and Soderstrom, G. F.: The Respiratory Metabolism in Nephritis, Arch. Int. Med., May, 1917, p. 865.

7. Epstein, A. A.: Concerning the Causation of Edema in Chronic Parenchymatous Nephritis; Abstr., New York Med. Rec., 1917. **91,** 128.

8. Epstein, A. A.: Jour. Exper. Med., 1914, **20,** 334.

9. A full exposition of it will appear shortly in the American Journal of the Medical Sciences.

On the basis of the views expressed, the methods pursued in the treatment of these cases are the following:

In the less severe cases, the patients are put on a high protein diet (from 80 to 200 gm. of protein daily), with a small quantity of carbohydrate and a total restriction of fats. The total food value of the diet ranges between 1,200 and 2,400 calories.

In the very severe cases, repeated transfusions of blood are resorted to, simultaneously with the administration of a high protein, fat-poor diet. At each transfusion (about 500 c.c.) an equal amount of the patient's blood is first removed. The effect of this procedure is threefold: (*a*) It ameliorates the anemia. (*b*) It increases the protein content of the blood serum. (*c*) It diminishes the fat content of the blood. These effects are illustrated by the example given in Table 3.

TABLE 3.—THE EFFECT OF PHLEBOTOMY AND TRANSFUSION ON THE COMPOSITION OF BLOOD*

Cell Vol.	Total Protein	Incoag. Nitrogen	Per 100 Cc. Globulin	Per 100 Cc. Chlorid	Cholesterol	Globulin in Protein
Per cent.	Gm.	Gm.	Gm.	Gm.	Gm.	Per Cent.
20	3.958	0.084	2.594	0.404	1.150	66.0
27	4.594	0.119	3.360	0.404	0.810	73.0
33	5.275	0.108	2.887	0.404	0.765	54.0

* The transfusions were done one week apart.

As is to be expected, the effects of transfusion are temporary, but they serve to initiate the desired changes in the composition of the blood serum. Chief reliance is placed on a high protein diet. The chlorids and the water are only moderately restricted. Thus far eight patients of the type described were treated. Of these, three received transfusions of blood in addition to the high protein diet; the others were treated simply by dietary measures. The results appear extremely encouraging. Many of the symptoms were thereby relieved, particularly the edema. The effect on the elimination of water, chlorid and other urinary substances is typified in Table 4. The most marked features in this table are the large output of water and chlorids.

TABLE 4.—THE EFFECT OF TREATMENT ON THE URINARY EXCRETION

Date 1916	Quantity C.c.	Urinary N. Gm.	Chlorids Gm.	Total Prot. Gm.	Globulin Gm.
March 1	425	4.455	.....	17.73	3.68
March 9	660				
March 10	590	8.425	2.178		
March 12	540	8.425	.....	5.84	
March 13	525	4.93			
March 16	1,050	5.984			
March 17	1,250	9.084	.....	9.94	4.78
March 18	1,500	7.686	9.585	14.4	4.14
March 19	1,340	6.415	15.983	14.8	4.15
March 20	2,450	9.947	35.485	20.1	5.95
March 21	1,680	5.738	21.200	14	5.06
March 22	2,260				
March 23	2,000	4.200	.....	39.2	6.65
March 24	2,300	5.345	27.434	41.2	5.88
March 25	2,100	4.645	24.154	35.6	4.48
March 26	1,900	4.096	23.474	39.9	3.34
March 27	1,420	.....	18.349		
March 28	2,500	9.100	29.820	13.1	
March 29	2,500	8.400	27.060	9.2	3.06
March 30	2,760	9.660	27.826	4.8	2.93
March 31	3,000	9.492	.....	12.6	5.77
April 1	2,600	.....	27.690		
April 2	2,500	.....	22.010		

Associated with the general improvement which takes place, one finds marked changes in the composition of the blood serum (Table 3), which in some instances return to normal. This is particularly well illustrated by the reduction in the fat content of the blood, as shown in Table 5.

It is realized, of course, that the use of a high protein diet in the treatment of nephritis is contrary to established rules; but on the grounds presented the procedure is in stricter compliance with both pathologic and clinical indications than the methods heretofore employed. We possess no definite evidence that protein food is per se deleterious to the kidneys. Eichhorst states that the protein in the diet does not affect the albuminuria in nephritis one way or another. My own experience is in accord with this

TABLE 5.—THE EFFECT OF TREATMENT ON THE CHOLESTEROL CONTENT OF THE BLOOD SERUM*

Date 1916	Cholesterol Gm. per 100 C.c.	Remarks
Jan. 20	0.625	
Jan. 26	0.665	Transfusion Jan. 29, 700 c.c. blood
Feb. 14		Transfusion 500 c.c. blood
Feb. 15	0.307	
Feb. 22	0.610	
Feb. 24		Transfusion 500 c.c. blood
Feb. 26	0.532	
March 3	0.625	
March 20	0.470	
April 7	0.465	
June 16	0.320	
Oct. 1	0.206	

* This patient was kept on a high protein diet from February 26.

opinion. Large quantities of protein, however, are necessary to restore the tissue waste and to replenish the depletion of the protein constituents of the blood. In practice the use of a high protein diet in the type of cases under discussion leads to improvement in general nutrition. This is evidenced by an increase in the protein content of the blood serum and by reduction of lipoids.

The employment of transfusion is a useful accessory, particularly in the severe forms of the disease. It initiates the very changes in the blood that it is desired to produce. From the experimental work of Rabens[10] we know that blood transfusion does not impair the functional activity of the kidneys. Burmeister,[11] on experimental and clinical grounds, states that transfusion of blood preceded by copious venesection inhibits the degenerative changes in the kidneys that are ordinarily produced, for example, in mercurial poisoning. My own observations show that the replacement of diseased blood, such as is found in these patients with healthy blood, is a beneficial therapeutic measure.

Improvement in the nutritional state of the patient is associated with the restoration of normal physicochemical conditions in the blood, by virtue of which a proper exchange of fluid between the tissues and the blood is reestablished. This leads to the elimination by the kidneys of retained water and various organic and inorganic salts.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MC LEAN, CHACE AND ROSE, AND EPSTEIN

DR. H. O. MOSENTHAL, Baltimore: These three papers represent types of investigation which are bringing us nearer our goal of a more efficient and rational therapy in nephritis. The dietetic therapy of this condition may be divided into three subheadings: a period of depletion, a period of maintenance, and a period of assimilation. Dr. Chace has taken up the problem of depletion of the patient from the point of view of nitrogen retention. Other questions, of course, present themselves when it is desired to have the patient rid himself of retained salt, water, acid substances or other metabolic end-products. The diets which best accomplish the elimination of retained nitrogenous material are those which embody a low nitrogen intake and a high carbohydrate content. The latter is just as important as the former, as the

10. Rabens: Am. Jour. Physiol., 1914-1915, **36**, 294.
11. Burmeister: Jour. Lab. and Clin. Med., 1917, **2**, No. 7.

carbohydrates are the most effective nitrogen sparers at our command. By diminishing the protein destruction through the administration of such food, naturally the amount of nitrogenous end-products presented to the kidney for elimination is diminished, and the impaired renal function can cope more efficiently with the task demanded of it. Alcohol, contrary to the accepted standards, has proved itself of value in these cases. It raises the calories of the diet, does not furnish end-products which must be excreted by the kidney, and apparently produces no untoward symptoms.

Dr. Chace has discussed many of the neglected factors of what constitutes a maintenance diet for these cases. The hardest, and I think the most important problem of them all is the period in which we desire to build up our patients. There is no great skill required in depleting these patients, or any great difficulty in giving them a maintenance diet; but to change the anemic, weakened sufferer with Bright's disease into a healthy, strong person is a different matter.

As the result of increasing the protein food, we have been unable to note any effect whatever of increasing the blood pressure. At times, headaches of an intense nature may be produced, and have to be guarded against. The greatest problem in this field today is to determine a method of feeding by which we may not only nourish, but also build up the patient suffering with nephritis. The efforts of Dr. Epstein constitute a step in this direction. We must recognize, however, that many of the factors involved have as yet not been investigated, and, we may justly say, have scarcely been thought of.

DR. E. F. DU BOIS, New York: The most significant point in Dr. Chace's paper is the rational method of planning a diet for a disease. The striking thing is that in most diseases there are comparatively small disturbances of the metabolism; of course, in diabetes there are profound changes, and in nephritis there is disturbance of the nitrogen elimination. Most people neglect the fact that carbohydrate and fat metabolism are not changed, and also that the total caloric requirement is comparatively little influenced in most diseases. For instance, the nephritic has about the same caloric requirement as the normal man. Although the disturbance in the disease may be small, the disturbance in diet is tremendous; that is, the patient is put on a diet neglecting the palate and the stomach and the racial peculiarities in appetite. It is true that one can keep a nephritic on a restricted diet for a long time without developing any of the so-called deficiency diseases, but, on the other hand, one must consider the possibility of developing not a physical scurvy, but a kind of mental scurvy as the result of a diet which deprives the man of the articles of food he likes. The caloric needs differ with the size of the man and the character of the nephritis. Most nephritics have about the same requirement as a normal man lying in bed; a few with parenchymatous nephritis have a lowered requirement, perhaps because of the lowered activity of the tissues. For instance, if a man is on a diet of less than 1,200 calories, he is being undernourished. If he is on a diet exceeding 2,000 calories he is overnourished and making up for previous loss.

One fact in nitrogen metabolism which has escaped attention in this country is that Carl Thomas found that he could reduce his nitrogen excretion to about 3 gm. a day and stay in nitrogenous balance if he took an exactly equivalent amount of nitrogen in his food in small divided doses. This is suggestive, because the nephritic who is on a diet containing nothing but sugar certainly has an endogenous protein metabolism which is equivalent to 3 or 4 gm. of nitrogen a day, and it is possible that this may be replaced by proper protein in the food in such a way that no extra work is thrown on the kidneys. I do not know of any experimental evidence in nephritis in regard to this point, but if the nitrogen in the food could be administered so that it merely replaced the wear and tear of the body, it would be a distinct advantage to the nephritic.

DR. VICTOR C. MYERS, New York: Dr. McLean has presented some painstaking observations on urea, but his charts unfortunately did not give data for the blood creatinin as well. The creatinin, on account of its endogenous origin, gives us a truer picture of the condition of nitrogen retention than the urea, and our experience has been that the blood creatinin and urea together give more information of value than the index of urea excretion. Most of us have been so much interested recently in the common interstitial nephritis that we have given little thought and attention to the much less common parenchymatous nephritis. I venture that most of us agree, in general, with the deductions that Dr. Epstein has drawn regarding this general condition. Dr. Epstein, several years ago, called attention to the disturbance in the relation of the blood proteins apparently resulting from marked albuminuria. His present work would appear to be the natural outcome of these earlier investigations.

Dr. Epstein referred to the association of diabetes with parenchymatous nephritis. Dr. Epstein's views regarding the relation of blood to edema are interesting, but the protein molecule is so large that it would not seem that the change in the protein itself could affect the osmotic pressure, although it might do this indirectly. The high protein diet would appear to be logical in selected cases of parenchymatous nephritis. I should like to ask Dr. Epstein concerning the exact type of diet employed, and what influence, if any, this diet had on the blood urea in these cases. Dr. Epstein has apparently taken the cholesterol as a simple index of the changes in the blood lipoids. This constitutes a very satisfactory criterion. I judge from his figures, however, that he has employed the Bloor method, which gives results that are probably too high.

DR. H. A. CHRISTIAN, Boston: The chief value in the contributions of Drs. Chace, McLean and Epstein lies in the facts, not theories, that have been presented. In the whole question of nephritis, fancy, not fact, dominates the situation. With the exception of the pathologic anatomy and histology and the observed clinical phenomena, about 90 per cent. of book discussion on nephritis is fancy. It is hypothesis, largely developed from the innermost soul of the writer and not from facts accurately observed and recorded. That is particularly true in the discussion of the treatment. Read in any of the systems of therapeutics or any of the systems of medicine the chapters on the treatment of nephritis and you end them feeling perfectly certain that the writer really had very little confidence in the methods that he advised you to use. Dr. McLean's idea of the relation of the excretion of urea in the urine to the urea in the blood has taught us that sometimes when there is a considerable accumulation of the nitrogenous substances in the blood, the kidney is still capable of doing good work. It has also shown us that sometimes when there is no great accumulation of nitrogenous substances in the blood the renal function is at a low level and conditions are much worse than would be anticipated from a study of the blood factors alone.

The real difficulty in the question of nephritis is that the important thing, the toxic element that produces the symptoms, is unknown. Yet if we give controlled diets, as these essayists have done, and observe the effects on the known substances such as creatinin, uric acid, urea and so on, we are approaching nearer to a conception of what is going on with the unknown substances. It is the study of the few cases accurately observed by numerical methods of observation of all sorts that is going to bring us nearer and nearer to the solution of the problem.

I should like to emphasize that the cases Dr. Epstein has dealt with are the unusual forms of nephritis. The results which he has obtained in that group may or may not be applicable to the common type of nephritis, the chronic interstitial type. As I take it, he has not so far particularly observed that group. I feel very confident from the basis of my own observations that, as has been emphasized by Dr. Mosenthal, it is advisable to limit not too much the protein intake in the ordinary type of nephritis. On the other hand, I am perfectly aware of the fact that a too great increase in the protein intake brings on a severe headache, and I have seen uremic manifestations appear from such an intake. I think that comes from increasing the protein too much, not simply from increasing the protein. I have seen patients improve by having more protein than they usually had, and

that makes up a larger group than the patients who are harmed by the increase. Like Dr. Mosenthal, I have seen very little effect on the blood pressure from reduced protein intake.

The diet of patients on the basis of anaphylaxis and protein immunization has been discussed a great deal, but here again we have very few facts; there has been surprisingly little work carried out on the protein sensitization in these cases. The work that Dr. Walker carried out on bronchial asthma could be carried out in these cases.

There is still one other thing which we ought to bear in mind, and that is that nephritis is a chronic disease; it occupies in many cases years of the patient's life. A week's observation and study of such a disease is only a partial investigation.

DR. L. F. BISHOP, New York: I like Dr. McLean's recognition of chronic nephritis as a general disease. Professor Ophüls of the University of California said that entirely too much attention is paid to the kidney, meaning by that that its diseases are part of a general disease. I do not agree with Dr. Christian that the laboratory is the main thing. I think that the physician with the patient on a diet can by observation reach valuable conclusions. I do not think that a week's laboratory study of a case of nephritis is of as much value as five years' observation under treatment. I agree with him in that. I agree with the chairman that the study of anaphylaxis is of value. I do not wish to emphasize it so much at this time, but I do not think we ought to go over this whole subject of nephritis while neglecting the importance of food idiosyncrasies. I was much interested in the speaker who said his patient got a headache when he was given a meal with meat. It shows the specific effect on a patient of some article of diet to which the patient is idiosyncratic. My own practice is to cut out of the diet as many proteins as I can and give them as much of a particular protein as they desire. I believe that the qualitative relation of proteins is the important one. Some patients get along with one protein very well when one has cut out the protein which is unfriendly to them. The point is to study the individual. Adequate feeding is a very simple matter, and I always says to the patient, "If your weight, the color of your blood and your endurance is satisfactory, you are getting enough to eat." It is a simple matter to weigh patients and to determine the color of the blood and to find how much they can walk without being exhausted; that does not require a laboratory. So that the only point that I wish to add is again to emphasize the importance of investigating this question of the particular relation of each protein food to the special patient, and whether I am right or not in my theory that arteriosclerosis is the result of a long continued series of anaphylactic reactions does not matter. Clinically I know that these people are better if I succeed in eliminating from their diets the proteins which are particularly unfriendly to them as individuals.

DR. N. ROSEWATER, Cleveland: Every individual requires 100 per cent. each of protein nutrition and carbohydrate. What that is we must ascertain. Less must result in general or local bankruptcy of lungs, heart, brain, kidneys, etc. I have had one case seemingly of eyes—the patient reduced from 170 to 123 pounds without discoverable cause or improvement until given twelve eggs daily. Her eyes at once improved and are now about normal. Increasing food gradually in starvation is continuous starvation, because to give less than 100 per cent. is still minus. To prove constructive the nutrition must be above 100 per cent. to restore lost essential vitality. We should not fear proteins, but rather the character of protein given. In the case reported, a severe headache soon followed eating meat, but meat contains toxic matter not yet excreted from the kidneys. Why give nephritics, with delicately balanced excretory power, the slightest surplus of toxic intake avoidable? Dr. Chace's diet is similarly objectionable. Why give cocoa, which contains two purin substances? Why asparagus? What good do they yield the patient? Pawlow demonstrated that, eaten without appetite, foods are digested perfectly by the various relays of digestive mechanisms; therefore, in desperate cases, why wait on appetite to secure digestion of required foods? Why not give what they need instead of what they like? I prefer eggs, especially raw, because the raw eggs contain not only protein, but every element necessary for initiating interactivating functions of every organ, all the hormones, ductless and all the other gland organs, constructive and protective substances, fresh and uninjured by cooking, requiring only body heat to bring into coordinate life. Compared to milk, this food is more complete, concentrated, bland, and taxes the digestive processes less in time and motility. Because buttermilk is finely curded and malted milk curds similarly, I prefer these and raw eggs when the heart and stomach must be saved from overwork. In selecting carbohydrates such as alcohol or sugar, alcohol, according to von Noorden, prevents destruction of toxic material by the liver, whereas sugar gives the desired readily utilizable carbohydrate without that danger. In the etiology of kidney diseases from the infections, diphtheria, syphilis and all the rest, the germs and their toxic products cause impairment; but where due to damage from intake and exit of avoidable material, those avoidable, such as alcohol, meat, purin foods, lead, etc., should be avoided.

DR. ALBERT A. EPSTEIN, New York: It was found that even when the kidneys are completely destroyed, as in chronic interstitial nephritis or surgical diseases of the kidneys, when a minimum of kidney tissue remains, no such changes as those found in chronic parenchymatous nephritis are ever encountered.

The question of association of diabetes with nephritis is of particular interest because it offers a suggestion of a possible method of treating the edema which develops in parenchymatous nephritis. I said in my paper that in cases of nephritis and diabetes the edema is very slight indeed, provided no heart complications are present. Furthermore, it appears from the studies on hyperglycemia in experimental and clinical diabetes that the accumulation of sugar in the blood leads to a dehydration of tissues. On the basis of these facts, it appears possible to find some means of preventing accumulations of fluid in the body. This subject is at present under consideration.

The substances which are reputed to be responsible for the edema in nephritis, namely, the chlorids, do not account fully for the occurrence of edema in chronic parenchymatous nephritis, for we find them retained in the intervariety of nephritis. The French have described a condition of chlorid retention in interstitial nephritis which they call a "dry" retention as opposed to the retention of chlorid in chronic parenchymatous nephritis, which is associated with edema ("wet" retention); but there must be some factor which causes the retention of water and salts other than the fanciful state of "dry and wet retention" suggested by the French investigators. Starling has found that proteins in the blood serum have an osmotic pressure equivalent to 4 mg. of mercury for every gram of protein. We know that the exchange of fluid between the tissues and the blood takes place as two balanced forces; one is the intracapillary pressure tending to force fluid from the blood stream into the tissues, and the other is osmotic pressure of the protein and other substances, as well, tending to draw fluid from the tissues into the blood stream. When an increased intracapillary pressure is present the composition of the fluid which exudes into the tissues is like that of the blood serum, as evidenced by chemical examination of the effusions in cases of venestasis from any cause. On the other hand, the fluid which accumulates in the tissues as the result of a lowered osmotic pressure, due to reduced protein content in the blood serum, is practically a solution of salts in water. This is demonstrated by examination of the composition of the various fluids which accumulate in chronic parenchymatous nephritis. The character of the diet which should be given to patients suffering from chronic parenchymatous nephritis is, first, white of egg and skimmed milk; this is then increased by the addition of lean meats, poultry and fish.

The cholesterol figures given in this paper were obtained largely by Bloor's method, and it is recognized of course that these figures are higher by about 10 per cent., but in a comparative study, such as this, they are sufficiently accurate.

A COMPARISON OF THE PERCUSSION AND ROENTGEN-RAY FINDINGS AFTER INJECTION OF THE PERICARDIUM *

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There is no more difficult problem in physical diagnosis, at times, than the recognition of pericardial effusion. This is particularly true when a patient is first seen after the effusion has occurred. The frequency with which the diagnosis is missed is known to all pathologists and to clinicians who are able to follow their cases to necropsy.

The physical signs of fluid in the pericardium are much less distinctive than the signs of pleural effusion. There are no pathognomonic signs, and there is no constancy in the grouping of physical signs.

Fig. 1.—Tracings made from a series of roentgenograms in Case 1. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The successive lines represent the picture after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

One of the most generally emphasized findings in pericardial effusion is a pear-shaped or pyramidal area of dulness, with the apex upward. This is not, however, a constant finding, as Shattuck[1] and West[2] showed, and its absence is of no importance in a diagnostic way. It is, too, a relatively late sign of effusion, one which becomes manifest only after the effusion is rather extensive and has distended the pericardial sac under considerable pressure. Calvert[3] maintains that with fluid under slight pressure the dull area tends to be more quadrangular.

A sign quite as generally associated with pericardial effusion is an obtuse cardiohepatic angle. Rotch[4] first drew attention to this in 1878 as the result of experiments on cadavers. He injected the pericardium postmortem in sixteen infants and four adults, using melted oil of theobroma (cacao butter, specific gravity 0.90) for injection. The cadavers were placed in a position of orthopnea, the trunk being flexed on the thighs at an angle of about 120 degrees. (The cadavers were not examined when the body was flat on the back, as West[2] says.) The peritoneal cavity was then opened, and the oil of theobroma was injected through the diaphragm into the pericardium. The area of cardiac *flatness* was percussed before and after injections. Rotch found that flatness extending from 2 to 3 cm. from the right edge of the sternum in the fifth intercostal space was encountered in adults after the injection of from 70 to 80 c.c. of the fluid, and considered this an important sign of pericardial effusion. He did not determine the extent of relative cardiac dulness.

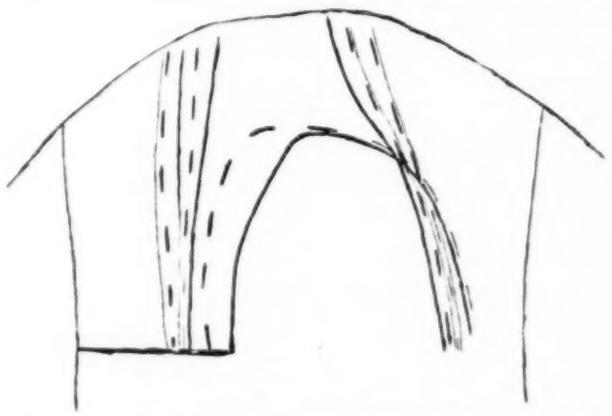

Fig. 2.—The lines represent tracings from roentgenograms of the area of percussion dulness in Case 1. The inner line represents the dulness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c. (Gastric tympany and infiltration of the left lung made percussion unsatisfactory in this case.)

The studies of Rotch stimulated interest in the percussion findings in pericardial effusions, and numerous observers, on living material, have shown that Rotch's experimental observations on the area of flatness often hold good; furthermore, it appears that the area of relative dulness is even more reliable than the area of flatness, and attention has been directed to the obtuseness of the cardiohepatic angle, which is nor-

Fig. 3.—Tracings made from a series of roentgenograms in Case 2. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The successive lines represent the picture after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

* Read before the Section on Practice of Medicine at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Shattuck, F. C.: Pericarditis: Some Points in its Diagnosis and Treatment, Tr. Assn. Am. Phys., 1897, **12**, 185-204.
2. West, S.: Pericardial Effusion: Its Diagnosis and Treatment, Lancet, London, 1910, **1**, 560-564.
3. Calvert, W. J.: Position of the Heart in Pericarditis with Effusion, Bull. Johns Hopkins Hosp., 1907, **18**, 403.
4. Rotch, T. M.: Absence of Resonance in the Fifth Right Intercostal Space Diagnostic of Pericardial Effusion, Boston Med. and Surg. Jour., 1878, **99**, 389; 421.

mally about 90 degrees. Ebstein[5] found this sign helpful in a series of forty-nine cases.

An obtuse cardiohepatic angle is, however, not diagnostic of pericardial effusion, and, as West[2] emphasizes, it is an unreliable sign. Cabot[6] refers to large pericardial effusions (proved postmortem) in which the cardiohepatic angle was acute by roentgenoscopy and by percussion. Such a finding is probably not exceptional, and it was similar experiences which led to the observations about to be reported.

The study was undertaken with two main objects in view, (*a*) to determine the shape of the cardiohepatic angle, and (*b*) to fix roughly the least amount of fluid in the pericardium which can be recognized by percussion and by roentgenoscopy with patients in the recumbent dorsal position.

Cadavers from two to six hours after death, still warm, were used. Extremely fat or edematous subjects were discarded. As pericardial effusions do not usually cause orthopnea till the quantity of fluid is great, and sometimes not then, we assumed that it would be more useful to examine the subjects in the dorsal position. It is probable that smaller amounts of fluid in the pericardium can be detected when the posi-

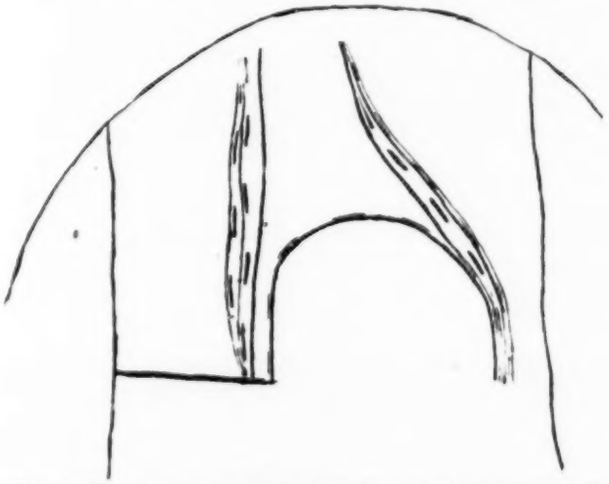

Fig. 4.—The lines represent tracings from roentgenograms of the area of percusion dulness in Case 2. The inner line represents the dulness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

tion of the patient is shifted, but we were interested rather in finding the earliest changes we could detect with the patient on his back. This more closely approximates the conditions in clinical work, particularly in those febrile cases in which attention is not directed to the pericardium by a friction rub.

Serous ascitic fluid was used for the injections. The needle was thrust into the pericardium in the fourth left intercostal space, close to the sternum. The needle was retained in situ till the injections were completed.

The percussion findings relate solely to relative dulness. Both threshold percussion and moderately strong percussion were employed, with no difference in results. The area of dulness was marked out before the fluid was injected, the boundary lines were covered with strips of lead, and a teleroentgenogram was then made. After each injection, the same procedures were carried out. The line marking the original area of dulness was kept in place for comparison. The tube was elevated so that it was about 6 feet above the anterior thoracic wall. The plate was placed at the back of the cadaver. The large end of the teleroentgenoscopic cone rested on the chest, and its location was marked with skin pencils. By means of marks on the floor, the positions of the cadaver and plate holder were kept constant. Four bodies were studied.[7]

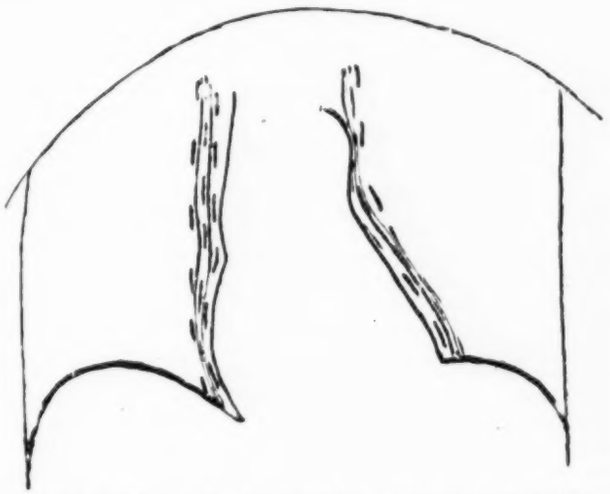

Fig. 5.—Tracings made from a series of roentgenograms in Case 3. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The succesive lines represent the picture after injection of 250, 500, 750, 1,000 and 1,500 c.c.

Fluid was injected in 250 c.c. amounts, with observations after each injection, until from 1,250 to 1,500 c.c. had been injected in each case.

The earliest important change noted by percussion was an *increase in the dull area upward*. This was constant in all four cases. It occurred after injection of variable amounts of fluid. In one case, after the injection of 250 c.c. of serous fluid, relative dulness rose from the third to the second rib, without change

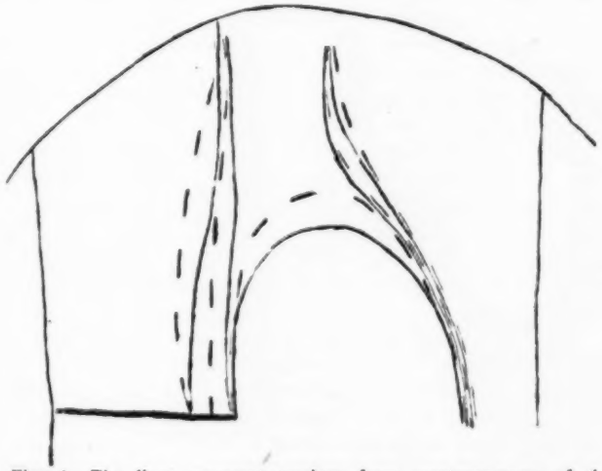

Fig. 6.—The lines represent tracings from roentgenograms of the area of percussion dulness in Case 3. The inner line represents the dulness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000 and 1,500 c.c.

in the dull area to the right or left. Distinct retrosternal dulness appeared after the pericardium con-

5. Ebstein, W.: Ueber die Diagnose beginnender Flüssigkeitsansammlungen im Herzbeutel, Virchows Arch. f. path. Anat., 1892, **130**, 418-443.

6. Cabot, R. C.: Physical Diagnosis, 1915, Ed. 6, 238.

7. The study was interrupted early in the spring, owing to the absence of one of us (E. R. B.) in England. As the examinations were largely made at night, when the Roentgen-ray laboratory was available, and as we insisted on having warm bodies, free from anasarca or obesity, a large series was not obtained. The close agreement of results, we feel, justifies reporting them.

tained 500 c.c. of fluid. In two instances there was no demonstrable change after injection of 250 c.c.; but after 500 c.c. of fluid had been introduced there was retrosternal dulness, while in the fourth case this appeared only after the injection of 750 c.c. With the appearance of retrosternal dulness and its subsequent gradual increase, there was a progressive widening of

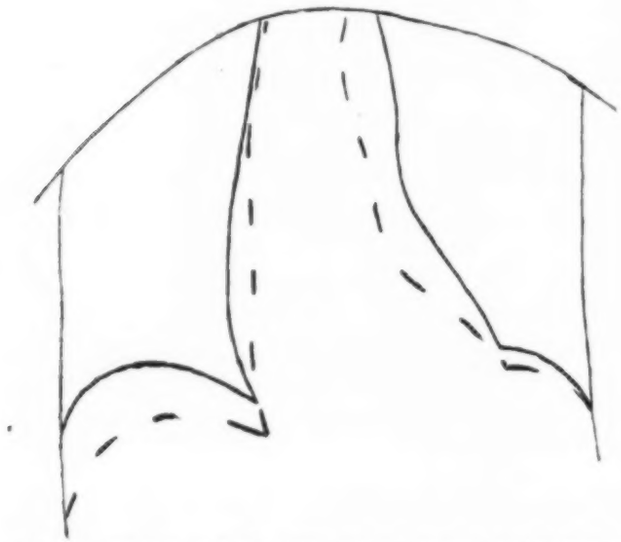

Fig. 7.—Tracings of the Roentgen shadows in Case 3 after injection of 1,500 c.c. of serous fluid. The continuous line is the outline of the shadow in the recumbent posture. The broken line represents the shadow in the erect posture. (See Figures 8 and 9.)

the shadow in the roentgenograms (Figs. 1, 2, 3, 4, 5, 6, 10 and 11).

The cardiohepatic angle was determined after each injection with the patient on his back. In no instance were we able to demonstrate an obtuse cardiohepatic angle by percussion or by roentgenoscopy. Indeed, the cardiohepatic angle became slightly acute by percussion in three of the four cases after injection of 1,000, 1,000 and 1,250 c.c., respectively, and remained so till the injection was discontinued at 1,500 c.c. In the fourth case, the angle remained a right angle by percussion throughout. In no instance was an obtuse angle found in the roentgenograms.

The earliest percussion change consisted in a widening of the area of dulness to the right; in three of the four cases this was noted after the injection of 250 c.c., in the fourth only after 500 c.c. had been introduced. Nothing characteristic or even suggestive of fluid in the pericardium was seen in the form of the dull area.

The fact that retrosternal dulness was the most striking change noted leads us to believe that this finding deserves more importance than has previously been attached to it. Sibson[8] was one of the first to call attention to it, and demonstrated that it followed injection of fluid (water) into the pericardial sac. Roberts[9] says: "As the patient lies on his back, the increase of dulness is first observed toward the base of the heart. It may extend as high as the second (left) costal cartilage or the first interspace or even above the clavicle." Sansom, says Roberts, maintains that whenever marked dulness extends above the third rib, there is a strong probability of pericardial effusion. Aporti and Figaroli[10] have shown, by injections of agar solutions into the pericardium, that in the horizontal position the great vessels are surrounded by a small quantity of fluid which falls away in the erect posture.

Though we have had opportunity as yet to test it on only one living patient, we are inclined to believe that retrosternal dulness should prove to be an especially helpful early sign, for it may be present with relatively small amounts of fluid (from 500 to 750 c.c. or less). Unless extensive pericardial adhesions exist to lessen its capacity, such an amount of fluid in the pericardium could be under no great tension, and the retrosternal dulness with widened roentgenographic shadows should, therefore, barring adhesions, disappear or become less with the patient sitting, owing to gravitation of the fluid to the bottom of the sac. The change is capable of demonstration not only by percussion but also by roentgenoscopy (Figs. 7, 8 and 9). With a tensely distended pericardium, marked shifting dulness could not be expected.

Less importance should be attached to the constant *absence* of an obtuse cardiohepatic angle. In all instances it happened that we were dealing with pericardia which were macroscopically normal (necropsy). Sibson showed that the normal pericardium does not stretch or bulge laterally to the extent that it does in disease, and our roentgenograms would seem to bear this out. The bulging (and, hence, the pyramidal dull area) is much less evident than in most roentgenograms we have seen of patients with pericarditis with effusion. Still, the injections agree with our clinical findings in some patients in proving that an obtuse cardiohepatic angle is by no means a constant finding. While the cadavers were percussed only in the dorsal position, we have observed patients in whom an obtuse angle was not demonstrable in the dorsal, erect or right

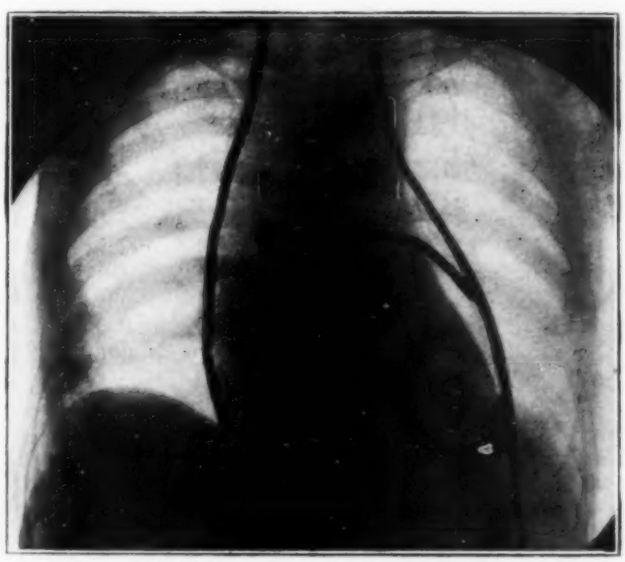

Fig. 8.—Roentgenogram of Case 3 in recumbent posture after injection of 1,500 c.c. of fluid. The dark lines represent strips of lead in the same position as in Figure 9 for comparison. Note the acute cardiohepatic angle in Figures 7 and 8 and depression of right side of diagragm in Figure 8.

lateral position, by percussion or roentgenoscopy, and in whom, at necropsy, pericardial effusion without adhesions was found.

8. Sibson, F.: Pericarditis, in Reynold: A System of Medicine, Philadelphia, 1877, **4**, 186-437.

9. Roberts, F. T.: Pericarditis, in Allbutt: System of Medicine, 1900, **5**, 762.

10. Aporti, F., and Figaroli, P.: Zur Lage der akut entstandenen Ergüsse im Herzbeutel: Experimentelle Untersuchungen Zentralbl. f. inn. Med., 1900, **21**, 737-749.

The quantity of fluid which may collect in the pericardium varies within wide limits. Thayer[11] reported the aspiration of 1,250 c.c. from the pericardium, and Shattuck removed about the same amount. It is unusual to obtain more through the aspirating needle, and yet Verney[12] found at necropsy 4,000 c.c. of fluid in a pericardium — the largest effusion recorded.

Fig. 9.—Roentgenogram of Case 3 in erect posture after injection of 1,500 c.c. (Compare with Figure 8.)

Sibson[8] said the pericardium of an adult man with healthy heart is capable of holding from 14 to 22 ounces (420 to 660 c.c.); yet we had no difficulty in injecting from 1,250 to 1,500 c.c. Probably more could have been introduced, had we pursued the matter.

There are few figures available as to the least amount of fluid which can be detected in the pericardium. Cabot says not less than 150 c.c. can be recognized. Rotch's injections indicate that half this amount may produce percussion changes. In patients, however, such amounts are practically negligible. Aporti and Figaroli found no change in the area of cardiac dulness until about 400 c.c. of fluid were injected. In the recumbent posture, our findings seem to indicate that 500 c.c. of fluid or less must be present to produce findings indicative of fluid.

We realize that the conditions in acute pericarditis with effusion have not been reproduced. The loss of tonus in the muscles, the absence of the heart beat and of respiration, and the lack of inflammation in the pericardium are serious defects. Hydropericardium is more closely approximated.

CONCLUSION

Our findings in fresh cadavers show that retrosternal dulness, with increasing retrosternal shadow in roentgenograms, is a relatively early phenomenon after injection of the pericardium with serous fluid, and suggest that shifting retrosternal dulness (loss or marked decrease in dulness, with decrease in the shadow in the fluoroscope or in plates) may be a relatively early sign of pericardial effusion. With fluid under great pressure in the pericardium, on the other hand, marked shifting dulness will probably largely disappear.

11. Thayer, W. S.: Observations in Two Cases of Tuberculous Pericarditis with Effusion, Bull. Johns Hopkins Hosp., 1904, **15**, 149.
12. Verney, cited by Thayer (Note 11).

ABSTRACT OF DISCUSSION

DR. CHARLES SPENCER WILLIAMSON, Chicago: I have been trying to attack the problem from a different point of view. It seemed to me that the injection of coagulable substances, such as gelatin and agar, had certain advantages because it enabled one, after the injection (I made them always through an incision in the abdominal wall and the diaphragm), to remove the pericardium and heart intact, after freezing the body. Then a modeller can make a cast of the entire mass and also of the heart, and the space between when filled up gives a cast of the exudate. The results of this work I read at Chicago, and they are in general similar to those that Dr. Morris has indicated.

The first thing we found was that with small exudates the fluid accumulated around the apex. The exudate that accumulates in the sternodiaphragmatic angle is thickest at the apex, then up behind on the diaphragmatic surface of the heart, and particularly over the great vessels. This corresponds to the findings of Dr. Morris that the retrosternal dulness is a definite thing. Many times we accidentally perforated the heart. The method has another thing in its favor, in that one knows the exact amount of the exudate. The first point I would make is that fluid in the pericardium tends to accumulate at the apex and on the diaphragmatic surface of the heart, and the first thing one notes clinically is a little dulness on the left and a pushing of the liver downward. I regard that as a valuable symptom of early pericarditis, together with retrosternal dulness. In regard to the cardiohepatic angle, my conclusions are the same as those of Dr. Morris. I was never able to demonstrate anything like an obtuse cardiohepatic angle. The pericardium softens up, as is well known. The diaphragm is pushed down, and this occurs in early cases and is a valuable sign of early pericarditis.

Why is the heart not covered by the exudate in front in every case? The answer can be summed up in these words: it is purely a question of the space between the sternum and the vertebral column as compared with the anteroposterior diameter of the heart. If the heart is relatively big, it impinges against the anterior part of the sternum and there is no effusion in front. The place to tap the pericardium is

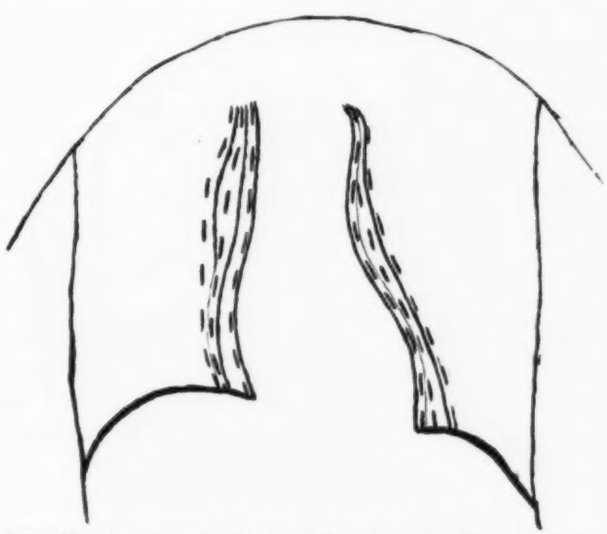

Fig. 10.—Tracings made from a series of roentgenograms in Case 4. From within outward, the alternating continuous and broken lines represent the heart shadow. The inner outline is the control before injection. The succesive lines represent the picture after injection of 250, 500, 750, 1,000 and 1,500 c.c.

invariably at the apex area, far enough out to be sure one is outside of the apex, inserting the needle either in the fifth or sixth interspace. One certainly takes a grave chance in going in to the right or left of the sternum. It seems to me we should go in at the apex in the fifth or sixth interspace, going upwards, backwards and inwards with the needle.

DR. ALFRED MEYER, New York: A patient came into my service at the Mount Sinai Hospital recently with a hemato-

pericardium of obscure origin. I aspirated the pericardium, withdrawing 1,350 c.c. of bloody fluid. In view of this being the third time of its accumulation, I decided to inject nitrogen gas in place of some of the withdrawn bloody fluid. I think that this is the first case in New York, possibly in the United States, of the making of an artificial pneumopericardium. The nitrogen gas pushed out the edge of the thickened (?) pericardium. With the patient leaning over to one side, the bloody fluid kept a horizontal level. There was a pericardial succussion sound when the patient was shaken. No spontaneous

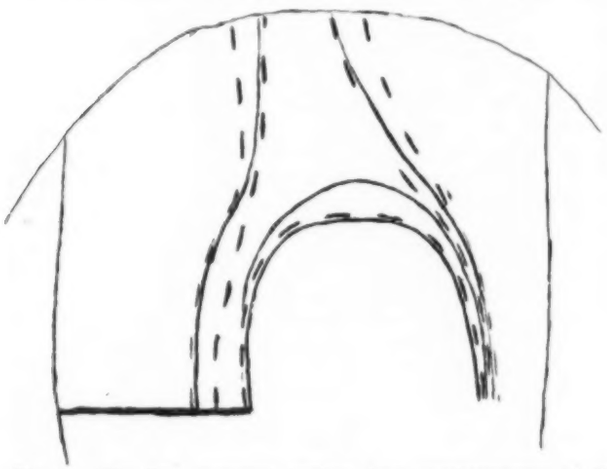

Fig. 11.—The lines represent tracings from roentgenograms of the area of percussion dulness in Case 4. The inner line represents the dulness before injection. The other succeeding lines are after injection of 250, 500, 750, 1,000, 1,250 and 1,500 c.c.

pericardial succussion sound was heard, in all probability because the systole lacked vigor. The succussion sound continued for four days after the operation of aspiration and nitrogen injection. I injected only 180 c.c. of nitrogen as a substitute for the 1,350 c.c. of withdrawn fluid, because I felt I was on new territory and wished to be conservative. Unfortunately the fluid has reaccumulated. Later I shall put in more nitrogen gas, up to one-half or two-thirds of the fluid withdrawn. Whether the patient has a new growth in the pericardium is an open question.

EVOLUTION OF CANCER OF THE BREAST *

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Fellow of the American College of Surgeons
NEW YORK

I do not believe we are in a position today scientifically to assert that there is such a thing as evolution of cancer of the breast. If cancer of the breast does occur as the result of a progressive series of processes, there have not as yet been made sufficient investigations definitely to demonstrate it as a fact.

My object in this paper is to review a certain amount of investigation which has been made by others in this direction and to attempt to correlate certain facts and thoughts, and if possible to initiate a standardized form of investigation, so that the future may give us data which we are at present lacking.

If we are to find that cancer of the breast develops by a process of evolution from the normal, I believe it will be found in a study of that complex disease, which, for want of a better name, I shall speak of as chronic cystic mastitis.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The life history of the breast is one of constant changes, both as to function and as to structure. There are times of quiescence when the true glandular elements—the acini and ducts—are so undeveloped as to be scanty and insignificant. Then there are times of activity when these glandular units are developed to an astounding degree. It would be impossible to recognize sections of the same breast taken at different periods. The breast of childhood is entirely different from the breast of adolesence. The breast during pregnancy takes on an entirely different character. Again, at the period of childbirth, the breast has changed completely. The period of lactation shows an entire change again. When lactation ceases an involution sets in, the glandular elements are decreased in size and diminished in numbers. Coincident with the menopause, after the period of function, the breasts become atrophic, and involution sets in. Now all these changes involve a complex variety of changes in the epithelial cells; in their structure, in their function, in the numbers, and in their relations to themselves and to their surrounding tissues. There is no other organ in the body in which the epithelium is in such an unstable state, its equilibrium so frequently disturbed.

As disturbed equilibrium of epithelium is one of the essential characteristics of chronic cystic mastitis, and as disturbed equilibrium of epithelium is the essential characteristic of carcinoma, one can readily understand the prevalence of these two diseases, their close association with each other, and one can almost believe that carcinoma of the breast is the end of a logical sequence—that it is the last stage of a progressive process.

Perhaps the best way to start this discussion is, first, to state in terms of histology a definition of the normal breast; secondly, to state in terms of pathology important structural changes which are found in chronic cystic mastitis; thirdly, to state in terms of pathology a definition of cancer of the breast; fourthly, to see if we are justified in tracing pathologic changes from the normal through the abnormal (in chronic cystic mastitis) to the condition which shall correspond to our definition of cancer, and finally, to see if we

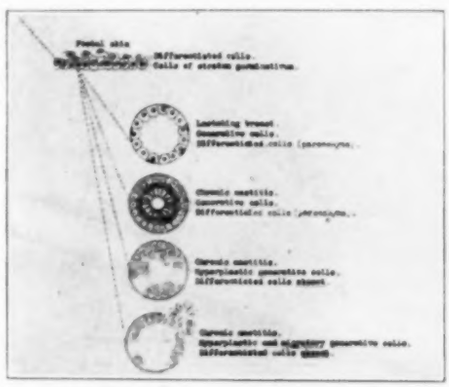

Fig. 1.—MacCarty's diagram illustrating his hypothesis as to the differentiated cells and the cells of the stratum germinativum.

can demonstrate that these changes take place in a more or less consistent sort of sequence. In other words, let us see if we can prove that the transition from the normal into the final development of cancer takes place through a progressive series of processes which may be called stages, in which case cancer would be recognized as the last stage, or if we may feel that those cases which finally become cancer do so by a

progressive series of changes which have taken place according to certain tendencies, which after all would amount to the same thing.

HISTOLOGY OF THE BREAST

For our present purpose we may set this forth in very simple terms. Embryologically the breast develops from the ectoderm, starting from the same cells that give origin to the skin. In this connection the breast may be considered as an inverted portion of skin which has been differentiated and evolved into a gland whose function is the secretion of milk. The breast consists of a fibrous tissue stroma or framework (enclosing lobules of fat), and the true glandular portion, which consists of a series of acini which are grouped together into lobules, groups of these lobules forming lobes. The acini are terminations of minute channels or ducts; these ducts empty into larger and larger ducts until finally those of a given lobe empty into one large duct, the galactophorous duct, which terminates at the nipple. Of these there are fifteen or twenty.

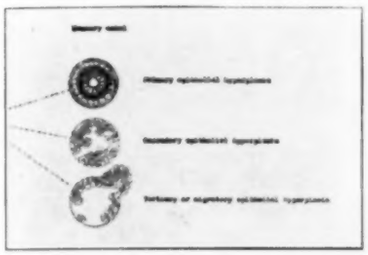

Fig. 2.—MacCarty's diagram illustrating his conception of primary, secondary and tertiary cytoplasia.

The smaller ducts and acini are lined with a basement membrane, the tunica propria, which is covered by a single layer of cuboidal epithelium. In the larger ducts this epithelium is found more flattened and cylindric, but in the terminal ducts and acini it is distinctly cuboidal in character.

Between the cuboidal epithelium and the basement membrane are to be found certain cells concerning whose morphology there may be said to be a certain amount of doubt. Most observers class them as basket cells which anastomose with each other; some regard them as connective tissue cells; some regard them as a form of endothelium; and some regard them as muscle cells derived from the smaller capillaries. MacCarty[1] of Rochester has quite a different conception of these cells. He believes them to be undifferentiated epithelial cells (cells from the stratum germinativum) which he calls germinal cells. According to MacCarty, it is these cells which become the cancer cell by the process of atypical and migratory proliferation. For our present purposes it is not necessary to dwell at length on all the structural elements of the breast, for it is the behavior of the epithelium which most concerns us.

The breast is a very peculiar organ which is not fully developed during a very large part of an individual's life. As its function is the secretion of milk, the gland is only fully developed during its period of active function, that is to say, for a more or less brief period after the completion of pregnancy. Strange to say, in the new-born infant the breast is more or less fully developed for a short space of time, and during this time it is not only capable of forming milk, but it actually does produce milk. This activity of function, which is accompanied by a corresponding structural development, is said to be activated and produced by the same internal secretion that activates the mother's breast at full term. A few days after birth, an involution takes place and the child's breast becomes quiescent and is essentially an undeveloped and rudimentary organ until the age of puberty, when it takes on a new activity and growth. During this period of latency the breast is devoid of acini; the glandular elements consist of a comparatively few branching ducts with cylindric ends. They are not dilated into true acini. After puberty, even the female breast continues in a more or less undeveloped form until the first pregnancy. Then for the second time in the individual's life the gland is a functionating organ. There is a great increase in the parenchyma of the gland, a great increase in the number and size of the acini; these are formed by a process of budding. The interlobular fat is absorbed and the whole breast is made up very largely of groups of acini with their ducts. Of course this means that there is great activity and proliferation of the true epithelium. At the time of childbirth the breast has taken on the state of colostrum production. This rapidly gives place to the true lactating state. At this time the acini are lined by more than one layer of cuboidal epithelium. The cells are hypertrophied as well as increased in number, and assume characteristics entirely different from those of the resting breast. After the function of lactation has ceased, an involution takes place, and the breast goes back more or less to the condition of that of the virgin, though the virgin condition is never fully resumed.

These cycles recur with each pregnancy, and finally with the menopause comes the true involution, the breast having ceased to have an active function. This final involution should really be considered as an atrophy. The glandular elements become deficient, not only in number but also in size. Unless the breasts are invaded by an excess of fat they become shrunken and atrophic. I consider this a condition entirely of atrophy, and not one of hyperplasia of any one of the elements.

Fig. 3.—Lactating breast of normal stillborn infant, showing all the characteristics of an adult functionating breast. This illustrates the normal condition of the breast of the new-born babe, male or female. It is a fact not generally known that the breasts at this period are fully developed functionating organs.

1. MacCarty, William: Collected Papers of the Mayo Clinic, 1915, 7, 903-919.

Thus it will be seen that throughout life the breast is undergoing a constant change. Its epithelium is in a condition of unrest; it has no definitely recognized equilibrium.

CHRONIC CYSTIC MASTITIS

The pathology of this disease for our present purpose may be stated briefly. This complex condition, which is almost without analogy in the body (if we except the prostate), consists of one series of phenomena which belong to the domain of inflammation; it consists of another series of phenomena which must be classed with hyperplasia; these again may be subdivided into forms of neoplasia, for they are evidenced by the production of tumor-like masses (fibro-epithelial). One point I wish to emphasize is that these neoplasias are not true tumors. A so-called adenofibroma or a fibro-adenoma thus produced is not a true isolated encapsulated tumor. It is a tumor-like mass, which is part of a disease of the whole organ. In cases of this disease we find hyperplasia of the connective tissue elements; a fibrosis, in other words. We find hyperplasia of the epithelium of the parenchyma. This may be more or less an atypical hyperplasia; this hyperplasia up to this point taking place within the acini and ducts. When migratory hyperplasia has taken place, that is to say, when the epithelial cells have penetrated the basement membrane and have infiltrated the stroma, a cancer has developed. If migratory hyperplasia is the last stage of chronic cystic mastitis, then the last stage of chronic cystic mastitis is cancer.

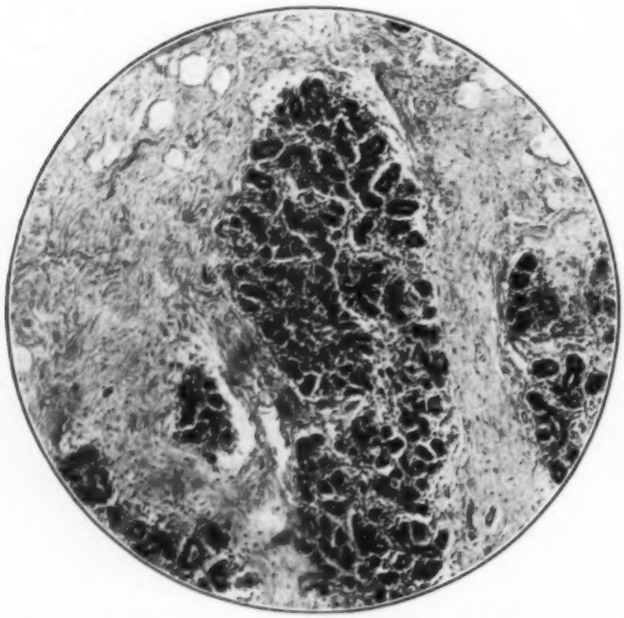

Fig. 4.—Normal adult breast, showing typical lobule with the normal proportion of fat cells, and with ducts of normal size. There is some increase of the fibrous stroma, no more than may be found in a normal adult breast. Figures 4 to 10 inclusive show sections of one breast. There was one section of this breast which definitely showed cancer; unfortunately this slide has been lost. These seven pictures illustrate some of the many pathologic changes which take place in chronic cystic mastitis. This one breast showed the various stages of the disease ranging from normal breast tissue to fully developed cancer. It aptly illustrates certain points which I attempted to bring out in this paper.

CARCINOMA

For the purpose of this study we may state the pathology of cancer of the breast almost in the form of a definition. We cannot do better than take Adami's:

We regard as cancer all cases in which there is infiltrative and apparently independent growth of epithelium or gland cells in the surrounding tissues, and this whether of only slightly atypical or markedly atypical cells.

Our present conception of cancer is that it is a growth of more or less atypical epithelial cells, the distinctive feature being the fact that these cells are growing in the stroma outside of the basement membrane. These cells to constitute cancer need not be very atypical in their morphology. It is their infiltrative growth that is the factor. Today we believe that a cancer cell is an otherwise normal functionating epithelial cell which for some reason or other has taken on the faculty of independent growth. Practically all authorities are agreed that cancer of the breast is made up of cells from the true parenchyma of the gland. MacCarty's theory that these cells are really undifferentiated cells which have displaced and replaced the differentiated cells, it seems to me has not the support of authority; and it also seems to me that it is not of material importance at the present time.

Though an extensive search through the literature has not revealed what we may regard as a conclusive proof of this question, still it shows that many leading authorities recognize the close relationship between these two diseases, and some state a quite definite belief in the idea that chronic cystic mastitis is the cause of cancer in a large percentage of cases. Let me state briefly the views of some prominent authorities as bearing on this subject:

Billroth[2] (1880) has been credited with making a more or less pertinent statement, in effect, that cancer does not seem to develop in an otherwise normal breast.

Heidenhain,[3] in 1889, and again in 1915, stated that cancer is always associated with precancerous changes.

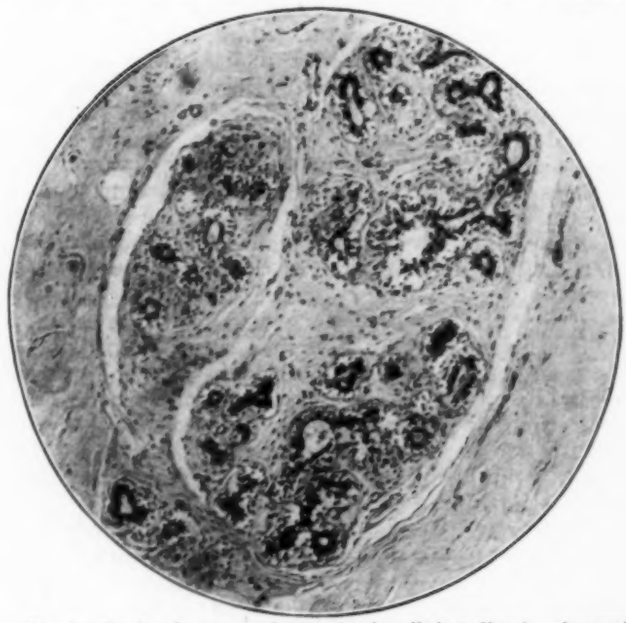

Fig. 5.—Section from same breast showing distinct fibrosis—abnormal involution. The glandular elements are compressed by the markedly increased acellular fibrous tissue.

Long ago (1889) he made a thorough study of a small number of breasts, as a result of which he stated that in cases in which even a small cancerous nodule existed, the entire breast was found to be abnormal.

2. Billroth, R.: Die Krankheiten der Brustdrüsen, Deutsch. Chir. Lfrg. 1880, **41**, 110.
3. Heidenhain, L.: Verhandl. d. Deutsch. Gesellsch. f. Chir., 1889, **18**, 1.

He found in every portion of the breast atypical proliferation of epithelium which even at that early date he considered a precancerous condition. He evidently believed that this precancerous condition was one which would probably end in cancer, for he argued that the entire breast must be removed in order to prevent the development of cancer.

Fig. 6.—Section from same breast showing distinct fibrosis and a diminution of fat cells, a large duct showing atypical proliferation of the lining epithelium.

Stöhr[4] states that the epithelium consists of a single layer. He regards the underlying cells as basket cells, not epithelium.

Verga[5] considers chronic cystic mastitis as occurring in two different types: first, an inflammatory type which particularly affects the stroma, and second, a type which is characterized by proliferation of the epithelium. This second type is most frequently found in association with carcinoma. He states there are no clinical signs to indicate the transition into cancer, and that the diagnosis of chronic cystic mastitis with carcinomatous metaplasia can only be made by means of a microscopic examination of many parts of the gland.

Cornil[6] describes the breast epithelium as occurring in a single layer of cuboidal or slightly flattened epithelium, except during the latter part of pregnancy and the period of lactation, when it occurs in two layers.

Krause[7] describes a single layer of cuboidal cells and another layer of basket cells on the membrana propria, that is, branching cells which anastomose with each other.

Todyo[8] describes chronic cystic mastitis as occurring in three stages (not three varieties): first stage, infiltration; second stage, cystic retention, and third stage, epithelial proliferation.

Kurn[9] describes the epithelium as occurring in a single layer. He regards the subjacent layer of cells as basket cells. He points out a difference in the glycogen content, the epithelium having abundant granules of it, and the basket cells containing very little. He takes Nagel's view of these basket cells, namely, that they are a form of muscle cells derived from the capillaries. Nagel pointed out the fact that these cells have different starving properties like muscle cells. Kurn regards senile involution as a form of atrophy. There is atrophy of the glandular epithelium and a collapse of the acini. The ducts are left but the epithelium more or less disappears. According to Kurn, the epithelium may grow in more than one layer under certain circumstances, first, in newly formed glands; second, in the course of certain inflammatory processes (tuberculosis), and third, in atypical proliferation. He states that this may be the first stage of cancer. According to Kurn, under the single layer of epithelium we find another layer of basket cells. The latter, he thinks, are probably muscle cells or endothelial cells coming from the capillaries. They are absent during the period of development and in the period of lactation when their place is taken by vascular capillaries. He assumes multicentric origin of cancer developing in fibro-adenomas. He describes the membrana propria as consisting of two layers, (*a*) the homogeneous, and (*b*) a layer of basket cells probably from the capillaries. He recognized the fact that multiple layers of cells constitute atypical proliferation and that these may become the preliminary stage of cancer formation.

Adami's[10] statement is clear and positive:

> There are obviously individual differences in reactive and regenerative powers, and these differences, in other words, the tendency to excessive cell growth, is an all-important factor in determining whether a given insult to the tissues leads merely to an orderly regeneration or to tumor growth. But

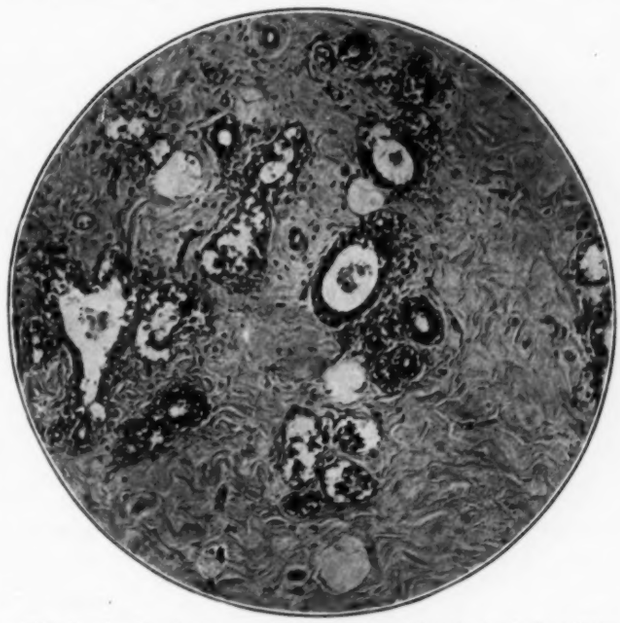

Fig. 7.—Section from same breast showing fibrosis, atypical proliferation of epithelium, and early stages of cyst formation.

> it is equally clear that simple irritative and regenerative hyperplasia, adenomatous growth, and carcinoma, are stages which can be manifested in succession by the same tissue; that the differences are those of degree and not of kind.

One of the most striking articles on this subject is that of MacCarty,[1] in which he analyzed the study of

4. Stöhr, P.: Lehrbuch der Histologie, Ed. 16, Jena, 1915, p. 405.
5. Verga, G.: Societa Med. Chir. di. Pavia, **14**, 1907; Zentralbl. f. allg. Path. u. path. Anat., 1908, **19**, 562.
6. Cornil, V.: Les Tumeurs du sein, Paris, 1908.
7. Krause: Kursus der Normalen Histologie, 1911, plate 98, figs. 207-208, pp. 427, 428.
8. Todyo, T.: Arch. f. klin. Chir., 1914, **104**, 440.
9. Kurn, H.: Deutsch. Ztschr. f. Chir., 1909, **98**, 415.
10. Adami: Principles of Pathology, p. 721.

1,373 cases of chronic cystic mastitis. I have found no other large series of cases which have been studied in like manner, and if this paper can stimulate others to work up their breast cases along similar lines I think we shall soon be able to accummulate a very important mass of material.

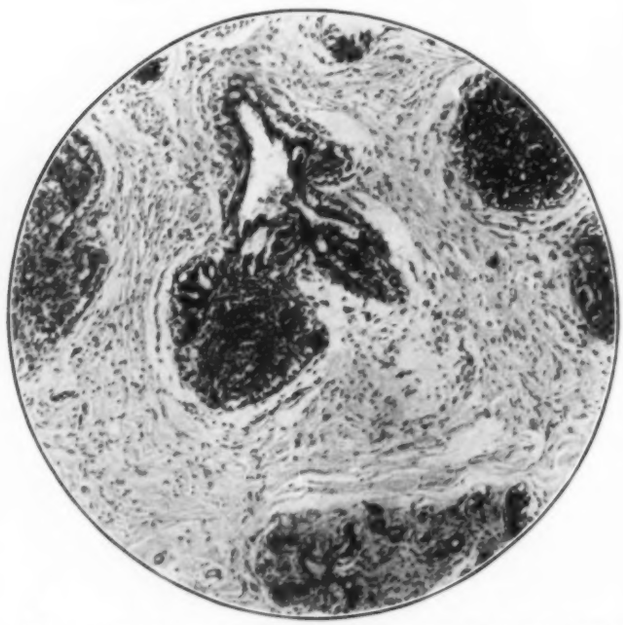

Fig. 8.—Section from same breast: precancerous condition; fibrosis; atypical proliferation of epithelium, producing definite epithelial plugs in dilated alveoli.

Usually in cases of breast cancer the pathologist has studied the tumor itself, and has not studied the rest of the gland. MacCarty states that in these 1,373 cases of chronic cystic mastitis there were 967 cases of cancer, and 406 cases of mastitis without cancer. He states that he found no case of cancer without chronic cystic mastitis, and that two thirds of the cases of chronic cystic mastitis were associated with cancer.

I might similarly quote from many other valuable contributions to this subject, but I must be content with referring the reader to the literature. Let me say, however, that with few exceptions, each author who has made a definite statement on this subject has set forth his belief that there is a very close relationship between chronic cystic mastitis and cancer of the breast.

Let us consider for a moment a few of the facts which we today recognize concerning cancer. First, it is conceded that there is no such thing as a specific cancer cell. Our present day conception is that cancers develop from normal preexisting cells which for some reason or other have taken on abnormal activity as to growth and as to function. Secondly, we believe that cancer is at first an absolutely local process. Thirdly, we believe that certain diseases and certain conditions act as precursors of cancer and may be considered as potential causes of cancer.

Prolonged irritation is recognized as one of the most frequent contributing causes of cancer. As instances we may mention the obsolete chimney sweep cancer; the clay pipe cancer; the Roentgen-ray cancer; the kankri cancer of the Thibetans, caused by the irritation due to heat, and mouth cancers in India caused by chewing betel nuts. There is no longer any doubt in the minds of our profession on this point. The question to be cleared up, however, is just why, and just how, prolonged irritation results in cancer. If we go back to our former proposition that a cancer originates in a normal body cell and that cancer is evidenced by a change in both the structure and the function of a cell, we may readily speculate as to whether these changes thus produced are not a response on the part of nature to the stimulus engendered by irritation, and whether they do not after all represent nature's attempt along the line of defense just as we see analogous processes represented by the phenomena of inflammation. This would perfectly agree with Adami's statement quoted above.

We have abundant evidence to prove the association of cancer with chronic cystic mastitis. Finney,[11] quoting others, placed the proportion of cancer as from 10 to 50 per cent. Greenough and Hartwell[12] place it at 10 per cent.; Warren[13] at 13 per cent.; Verga[5] found five cases of cystic mastitis with cancer among twenty-eight cases of tumors in the breast; Lockwood[14] in forty cases found eight cases of cancer, and three which he marked as suspicious, making more than 20 per cent. Taylor[15] found it in 50 per cent. of his cases; MacCarty[1] found it in about 70 per cent.

In this connection, if we study the etiology of chronic cystic mastitis we will find that it is due to some form of irritation. Let me quote from an article of my own:[16]

> Being an inflammation, we must assume that the phenomena are really a series of responses to some form of irritation, either mechanical, bacterial or chemical.

I have long felt that chronic cystic mastitis is a complex process, that the various changes in structure represent definite stages of the disease, that abnormal

Fig. 9.—Section from same breast: precancerous condition; fibrosis; atypical proliferation of epithelium; epithelial plugs in dilated ducts and alveoli with papillary overgrowth of epithelium in ducts.

11. Finney, J. M. T., in Keen: Surgery, 1910, **3**, 568.
12. Greenough and Hartwell: Jour. Med. Research, 1903, **9**.
13. Warren, J. C.: Surgical Observations on Tumors, Boston, 1837, p. 279.
14. Lockwood: Cancer of the Breast, 1913.
15. Taylor, W. J.: Tr. Phila. Acad. of Surg., 1911, **13**, 90; Ann. Surg., **52**, 250.
16. Syms, Parker: Chronic Cystic Mastitis or Abnormal Involution of the Breast, Ann. Surg., 1916, **64**, 696.

hyperplasia and hypertrophy of the epithelial cells resulting in penetration of the basement membrane and infiltration of the stroma is the last stage, and this is cancer. If this is true, we may restate it by saying that chronic cystic mastitis is a progressive disease which will proceed to the production of cancer unless its progress is arrested before it proceeds to its logical conclusion. A demonstration of this will take us a long way toward the elucidation of the evolution of cancer of the breast.

If sufficient investigation will prove, as MacCarty[1] has found, that cancer of the breast does not occur without chronic cystic mastitis, shall we not have strong support for the hypothesis that cancer of the breast is caused by some form of irritation which first results in chronic cystic mastitis, and which finally results in cancer by a form of transition from one stage to another until the final stage of infiltrative cellular hyperplasia, which is cancer?

With this in view I strongly urge practitioners to examine not only the tumor but also the whole breast in the future, and to publish their findings, so that we can throw much needed light on this important question.

If we can prove that cancer develops by a process of evolution, and if we can learn just what are the precancerous stages, we can certainly apply that knowledge for the prevention of cancer. Curing or removing precancerous conditions will, of course, prevent the development of cancer.

361 Park Avenue.

Fig. 10.—Section from same breast: typical intracanalicular adenofibroma.

ABSTRACT OF DISCUSSION

DR. DANIEL N. EISENDRATH, Chicago: The relation of chronic cystic mastitis to cancer of the breast is the most important one in this field of surgery at present.

Some of the statements made by Dr. Syms, I am afraid, assume conclusions before the proof has been accepted by both sides, and are apt to lead to the belief that every case of chronic cystic mastitis is a potentially malignant one and should be subjected to a radical procedure. I refer especially to his statements that because both this disease and cancer show disturbed equilibrium and are associated at times, there is a close connection between the two diseases. Again, he assumes that migratory hyperplasia is the last stage of chronic mastitis, hence this last stage is cancer. Now such statements are misleading and many breasts will be amputated uselessly unless these deductions are made less general. He quoted authors who report finding chronic cystic mastitis associated with cancer in from 10 to 70 per cent. of their cases, but no one has ever seen such a direct transmutation of one into the other. In many cases the proliferation of epithelium may be very advanced without any invasion of the connective tissue. I am willing to grant, and my experience amply confirms the necessity of impressing on every general practitioner, as well as surgeon, the fact that every case of chronic cystic mastitis must be most constantly watched for the possible development of signs of malignancy. This means that we must adopt a certain standard of procedure toward the cases, which present themselves more frequently in single than in married women as localized or diffuse areas of induration or cysts, usually painful, especially during menstruation, without enlarged axillary glands, as a rule, and often with such hard lumps that we feel certain we are dealing with a carcinoma, only to find at operation a tense cyst. In this class of cases I would also include those with bloody, serous or milky discharge from the nipple, no matter at what age they present themselves, because these are due to papillomatous formation within the cysts, whether we call it chronic cystic mastitis or abnormal involution. Its protean clinical character demands treatment according to its salient pathologic features as follows: 1. In very young unmarried women one can safely wait until after marriage and then caution them to be examined from time to time. 2. Every breast with many cysts and considerable induration in women above the age of 35 should be examined by a transcutaneous incision in its upper half and a plastic operation in its lower half. If the surgeon believes from the area seen that it is cancer (every operator must have sufficient training in pathology to tell this from the naked eye appearance), he should make radical removal of the breast, adding to it a supraclavicular dissection if the area was in the upper half. If frozen sections show epithelial hyperplasia but nothing definitely carcinomatous, it is best to perform a conservative amputation.

DR. PARKER SYMS, New York: It is one of the most difficult questions for a surgeon to decide just what he should do with these cases. Each one should be treated individually. Personally, I believe I have been very conservative in my operations in this class of cases. I have removed very few breasts for this condition where I have not had a suspicion of cancer, and in some of these I have found that there was taking place a transition into cancer. We know there are no symptoms which definitely indicate such a transition. Dr. Eisendrath must have misunderstood me, though I thought my expression was clear enough. I did not say that the last stage of chronic cystic mastitis must be cancer. I said it may be. I said chronic cystic mastitis is a complex process, evidenced by signs of inflammation, of hyperplasia of the different elements; by cyst formation, etc., and that I believed that its last stage was carcinoma; if so, that it would reach that point provided it proceeded to its logical conclusion, just as there is only a proportion of human beings who go on to 80 years of age. I feel that a most important thing is to make a distinction between the hard, tumorous masses we find in this disease, and true tumors. These so-called tumors are not tumors at all, though they may have a typical appearance under the microscope. They are part of a disease, and they are a peculiar form of neoplasia. You cannot remove them without cutting through breast tissue. The frozen section is unreliable. I believe that Dr. Ewing, who is one of our highest authorities on carcinoma, refuses to employ frozen sections in these cases. Sometimes it is only after twenty, thirty or forty sections that one will run across one that shows cancer. Among the illustrations there are seven taken from one breast. They range from the normal through various stages of abnormality. There was one section that showed cancer and it was not found until this breast had been examined by several pathologists. In closing I wish to urge surgeons to examine breasts in toto as MacCarty has, and as Heidenhain did in 1889.

INTUBATION OF THE LARYNX

AN ANALYSIS OF THREE HUNDRED AND FIFTY CASES IN PRIVATE PRACTICE *

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Pediatrician, Conemaugh Valley Memorial Hospital and Mercy Hospital
JOHNSTOWN, PA.

Laryngeal diphtheria, requiring intubation, has been considered by most pediatricians as a disease for hospital treatment. It is because of this belief that I decided to present an analysis of 350 cases occurring in my private practice in the hope that results obtained under the most adverse conditions may lead to more general use of this operation when hospital facilities are lacking.

Johnstown, Pa., is the center of vast steel and mining industries which attract a large population of laboring people of both native and foreign birth. The homes of many of these are overcrowded and living conditions are unhygienic, resulting in many of the children having chronic catarrhal conditions of the upper respiratory tract. There is concealment of disease through fear of quarantine, and exposure to disease through ignorance of contagion and indifference to it. These conditions made a fertile field for epidemics of laryngeal diphtheria in our community during the years 1905-1917. The increase in the number of cases intubated is due primarily to the epidemics and secondarily to increasing knowledge among my fellow

TABLE 1.—NUMBER OF PATIENTS PERSONALLY INTUBATED IN DIFFERENT YEARS

Year	Cases	Year	Cases
1905	1	1912	106
1906	0	1913	48
1907	4	1914	66
1908	6	1915	21
1909	13	1916	13
1910	28	1917	11
1911	33		
		Total	350

physicians of the success of the operation so that each child was given the chance of intubation if needed.

I am indebted to sixty-five of my colleagues for 295 of this series, one of them having thirty-eight cases. All of the cases in the series developed within a radius of 15 miles. One hundred and fifty-two patients were of foreign parentage, 198 of native parentage. There were 182 males and 168 females. The conditions for operation were far from satisfactory. In six cases I was called when the child was moribund, having had no previous medical attention; in many others the operation was delayed until the child's condition became desperate. With a child urgently in need of operation, time had to be taken to gain the consent of the parents, in foreign families through the aid of interpreters. For operating we used the kitchen table, bed or two chairs; in one case the floor. The light was always poor. A parent, neighbor or physician was pressed into service to hold the patient. The physician, through interest in the operation, frequently failed to hold the child properly. The other helpers failed through nervousness.

After operation I had little control of the patients in families in which I was called by another physician. In many cases the physician made the daily visit, reporting to me by telephone each day. Sometimes we arranged to visit the patient together daily. At other times the case was referred entirely to me until discharged. The patients had no nursing care, bathing, or special diet, except in eighteen instances in which the nurse had had no previous experience in this work. Many of the patients were not kept in bed but played as usual with the children of their own and neighboring families in spite of quarantine. I have nothing new to offer as to technic. I use O'Dwyer's instruments with hard rubber tubes, having found nothing that is an improvement over them. I have never had occasion to use specially constructed tubes. I intubate

TABLE 2.—AMOUNTS OF ANTITOXIN GIVEN

Units	Patients	Units	Patients
0	6	16,000	7
2,000	1	17,000	7
3,000	3	18,000	3
4,000	1	19,000	2
5,000	22	20,000	42
6,000	10	22,000	1
7,000	12	23,000	1
8,000	18	24,000	1
9,000	10	25,000	11
10,000	73	30,000	3
11,000	11	32,000	1
12,000	13	35,000	1
13,000	2	50,000	1
14,000	1		
15,000	86	Total	350

with the child in the dorsal position. Since several unpleasant experiences I always remove the string; if it is not removed the child must be restrained. The string irritates the pharynx, causing persistent coughing. There is also danger of the child biting it off. Since this routine was adopted, only one patient has been lost by the tube blocking and death resulting before aid could be secured. I always use the tube indicated for a child from 6 to 12 months older than the patient, because it is less liable to be coughed up from the first to the third day. After this time the accident is not feared.

Fifty-seven per cent. of the patients received from 10,000 to 20,000 units. Early in the series, difficulty was experienced in obtaining a sufficient amount of antitoxin because of its high cost, and also because the prejudice and ignorance of the parents often prevented its use in sufficient quantities. This was before the day of free antitoxin furnished by the state. It was my practice at that time to administer from 2,000

TABLE 3.—NUMBER OF PATIENTS RECEIVING ANTITOXIN

Age, Years	Neither Before Nor After	Before Only	After Only	Before and After
1	1	1	2	7
1½	1	5	6	29
2	1	3	6	23
2½	0	10	7	19
3	0	5	9	32
3½	0	0	1	2
4	0	5	5	25
4½	0	0	0	1
5	3	7	16	37
5½	0	0	1	0
6	0	4	5	13
7	0	3	6	14
8	0	4	2	11
9	0	3	0	11
10	0	1	0	0
14	0	1	0	1
34	0	0	0	1
Totals	6	52	66	226

to 10,000 units and repeat it in from six to twelve hours if necessary. This method required repeated injections, kept the patient in constant fear and pain, and caused the parents to interpose strong objections. During the past few years, with free antitoxin and less prejudice against the remedy, I estimate by the severity of the case the probable total needs, and inject this quantity in one dose, anywhere from 15,000 to 50,000 units.

* Read before the Section on Diseases of Children at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

The first and greatest advantage of this method is that it furnishes the patient with antitoxin when he most needs it. The antitoxin is given intramuscularly, the gluteal muscles being the location of choice. Sixty-five per cent. had antitoxin before and after intubation. Six patients had no antitoxin, and all died within two hours after intubation, being in fact moribund when the physician arrived. Fifty-four per cent. of the patients were ill from one and one-half to two days before intubation. The tube was worn five days by 223 patients. It was noted that those wearing the tube for this length of time were less likely to require reintubation than those extubated earlier.

After removing the tube I always remained with the patient until all danger of returning stenosis was past. The usual time was two hours. Rarely did a case require reintubation after this time. However, I was always ready to return if the child's condition grew worse. The diet prescribed depended largely on the condition of the patient and the character of the home. Liquids and soft solids were allowed as soon as the patient was able to swallow. It was impossible to control the patients in most cases. In spite of orders, some patients ate at the table within twelve hours after intubation.

I have never had occasion to use the Casselberry method of feeding or to resort to gavage. For stimulation I relied mainly on caffein sodium benzoate. In septic cases mercuric chlorid was used together with whisky or brandy.

TABLE 4.—DAY OF ILLNESS

Days	Cases	Days	Cases
½	1	5	9
1	57	6	2
1½	64	8	2
2	124	10	2
2½	23	12	1
3	52		
4	13	Total	350

In this short paper it is impossible to do more than point out the prominent features of this series. The tables will show all the essential facts. The complete history of each case is available, but I can use it only to verify and amplify statements made in this sketch. Some of the striking incidents and results noted are:

In 350 cases there were no chronic tube cases. There was no case requiring tracheotomy. A curious opinion prevailed among the people. The results of tracheotomy were confused with those of intubation, and the latter procedure was believed to be followed by the same distress and fatality as the former. Much explanation and pleading was required to convince some parents of this mistake. Two patients coughed up the tube and cast. Both recovered. One family had three cases requiring intubation. Ten families had two cases each. The youngest patient intubated was 7 months old. The eldest was a woman aged 34 years. Only one patient was intubated twice. The interval between the two attacks of the disease was two years. Many patients complained of earache. In three cases the tube blocked and casts were coughed up immediately after extubation.

Many cases of laryngeal diphtheria were secondary to pharyngeal cases in other members of the family. The reverse occurred only a few times. In 350 patients only thirty-two required reintubation. Twenty-eight required 1 reintubation; one, 2; one, 3; one, 4, and one, 5. In the latter case phonation was imperfect for a time, but became clear after seven months. Permanent disturbance of phonation did not occur in a single case.

Kidney complications did not occur or were overlooked. The latter is quite possible, as both my own and the attending physician's connection with the case terminated with extubation. With the return of the child to apparent health, the parents did not believe medical services were necessary, and for them the case was at an end.

Marked anemia was observed in only a few cases when, after from five to seven days, stenosis developed following pharyngeal diphtheria. Of 350 patients forty-eight died, a mortality of 14 per cent. If we deduct thirteen dying within six hours after intubation, we have a total left of 337 cases with thirty-five deaths, a mortality rate of 10 per cent. One child died of postdiphtheric cardiac paralysis seven days after extubation. One patient was in excellent condition when extubated, but instantly developed spasm of the glottis and died within one minute, before the tube could be replaced. In one case the tube became blocked with membrane and death resulted before aid arrived.

TABLE 5.—DAYS TUBE WAS WORN

Days	Cases	Days	Cases
¼	4	5	223
½	6	6	6
1	5	7	1
1½	2	9	2
2	5	10	15
2½	0	11	5
3	16	15	1
3½	2	21	2
4	47	No time	5
4½	3	Total	350

A child 1 year old had frequent convulsions before its attack of diphtheria. It was intubated and did well for five days. One hour before the tube was to be removed it had a convulsion and died within twelve hours. The tube was clear at all times. One child while playing in the yard on the fourth day coughed up the tube and was dead before the mother was aware of the accident.

In the cases of death from heart failure some were due to septic diphtheria in which stenosis was the late secondary complication. Some had a severe type of scarlet fever with septic throat and late stenosis. One patient had pertussis when laryngeal diphtheria developed. Threatening stenosis was relieved by intubation. At each extubation extreme paroxysms of coughing and stenosis required immediate reintubation. The operation was repeated three times but exhaustion finally caused death. The most frequent cause of death was diphtheritic pneumonia. Twenty-seven patients developed this condition and none survived, accounting for 56 per cent. of the deaths.

TABLE 6.—CAUSES OF DEATH

Heart failure	8
Sepsis	5
Diphtheritic pneumonia	27
Scarlet fever	2
Pertussis	1
Pulling out tube	1
Spasm of glottis	1
Tube blocked	1
Convulsions	1
Coughed up tube	1
Total	48

At the beginning of this series, my practice was to operate when symptoms threatened life. Following this plan lives were lost that might have been saved because the attending physician or parent could not interpret the danger signals. As a result I now operate when the diagnosis is clear and positive, as indicated

by the voice and cough, beginning dyspnea and the gradually increasing distress in spite of treatment. I never wait until conditions become alarming. I admit that, in these days of antitoxin, many would recover without operation; but I feel that my low mortality is due wholly to early operation.

The necessity of reintubation did not add to the gravity of the prognosis, none of the thirty-two patients needing reintubation having died, unless one excepts the case complicated by pertussis, referred to above. The better the patient's general condition the less likelihood of returning stenosis. There was no way of telling how long a patient could go before needing intubation. Each case was different. The comfort of the patient depended largely on how high the tube rested in the larynx.

I never found that sedatives helped to prevent reintubation. I gave all a fair trial. The confidence of the patient was the greatest aid in this matter. The temperature rose sharply after intubation when stenosis had threatened life. No patient was lost in which intubation was performed early. The duration of the illness was no gage of the severity of the case. Contrary to the prevailing opinion, I have found extubation easier to perform than intubation.

TABLE 7.—GENERAL SUMMARY

Age	Number	Neither Before Nor After	Before Only	Antitoxin: After Only	Antitoxin: Before and After	Reintubations	Recoveries	Deaths	Recoveries, Per cent.
1	11	1	1	2	7	3	8	3	73
1½	41	1	5	6	29	4	39	2	95
2	32	1	2	6	23	6	24	8	75
2½	36	..	10	7	19	2	34	2	94
3	47	..	6	9	32	4	41	6	87
3½	3	..	..	1	2	1	2	1	66
4	33	..	3	5	25	3	27	6	82
4½	1	..	..	..	1	..	1	..	100
5	64	3	8	16	37	2	54	10	84
5½	1	..	..	1	..	1	1	..	100
6	24	..	6	5	13	1	22	2	90
7	23	..	3	6	14	1	20	3	81
8	17	..	4	2	11	1	16	1	94
9	14	..	3	..	11	2	11	3	80
14	2	..	1	..	1	..	1	1	50
34	1	..	..	..	1	..	1	..	100
Total	350	6	52	66	226	32	302	48	86

In Table 7 I have condensed the foregoing tables, giving facts and records in order that comparisons and study can be more easily made. I trust they will be of benefit to the future of laryngeal diphtheria as treated in private practice.

CONCLUSIONS

1. No patient needing intubation should be denied the chance to live because of lack of hospital facilities.
2. Overcrowding of homes, unhygienic surroundings, concealment of disease, and exposure to contagion are responsible for the epidemics.
3. Lack of trained assistants need not deter one from operating.
4. The use of a tube larger than that indicated for a given age gives better results.
5. Early intubation with large doses of antitoxin reduces the mortality.
6. Wearing the tube five days resulted in fewer reintubations.
7. It appears that special diet and methods of feeding are unnecessary.
8. Reintubation does not seem to affect phonation permanently.

ABSTRACT OF DISCUSSION

Dr. J. F. Hogan, Baltimore: We have found, especially in younger children, that the administration of antitoxin in laryngeal diphtheria will not dispense with the necessity for intubation. It has been said that by giving large doses of antitoxin, these young children are able to do without intubation. I have not found that to be true. I do not think antitoxin works quickly enough in laryngeal diphtheria to justify us in delaying either intubation or operation.

Dr. H. L. Whitney, Plymouth, Pa.: I do not think that every case of stenosis of the larynx is diphtheria. Those that are diphtheria are more amenable to intubation than those that are not. It has been my experience with diphtheria patients that they do not have to wear the tube more than three or four days on an average, while in other cases it is often several months.

I prefer using one large dose of antitoxin, and not repeating it on account of anaphylaxis, which occasionally occurs when several successive doses are given.

In regard to feeding, of course milk and liquids are to be given. After giving milk, I always find it advantageous to give a drink of water, as there will be a drop or two of milk collect in the tube, and this may be a nucleus for blockage. We know after a child drinks there is always a little cough. If a child drinks continuously, without intermission, there will be no cough until cessation of the drinking.

I disagree with Dr. Cartin about extubation being easier than intubation. Occasionally it is difficult to extubate. If the child does not get in just the right position, we may miss the tube. When I first began intubation, I secured one of the original intubation sets. I found difficulty in extubation. I had an extractor made about 1½ inches shorter than the usual extractor. This facilitated extubation in infants. I often find the first tube drops out. I put them in according to the ages in the beginning. If the tube drops out, I put in the larger size next time. We have difficulty with the foreign population; they run around and eat everything. One child ate popcorn, the tube became blocked and the child died before my arrival.

The average physician is afraid to push the tube down far enough; he is afraid he will lose it. It requires quite a little force to get it properly seated beneath the epiglottis.

Dr. A. J. Bell, Cincinnati: I have charge of the contagious group at the Cincinnati General Hospital. There are several remarkable features about Dr. Cartin's series. One is to have so many cases in private practice, and another, to have such good results. Those of us who have had our cases in the hospitals are getting constant reports about how the tube was coughed up or pulled up, and if the intern had not arrived that minute, etc., the child would probably have died. Only one death in this large series from coughing up the tube is remarkable. We will all agree, of course, that the ideal place for an intubation case is the hospital, where it may receive prompt attention in emergency. As to the dose of antitoxin, the subcutaneous method has been practically given up entirely, and only the intramuscular and intravenous routes are being used.

The maximum absorption curve of antitoxin in the intravenous, intramuscular and subcutaneous methods is approximately eighteen, thirty-six and seventy-two hours.

Dr. Isaac A. Abt, Chicago: Dr. Cartin's paper emphasizes a point we have known for a long time, that the men who do the most operations and become the greatest experts in

intubation are not the specialists, but the men in general practice who are out in the field doing the work. I have intubated in both the sitting and recumbent positions, and while every man must work out his own technic from experience, it has always seemed to me that the more favorable position was when the patient was sitting up.

As to the use of a slightly larger tube than is indicated by the age of the child, I have the feeling that there is increased danger of trauma in both introduction and extraction. It seems to me that results will be better if one uses the tube that is indicated—one that does not fit too snugly.

I am surprised that Dr. Cartin's youngest patient, intubated at the age of 7 months, recovered. My experience, which is in agreement with statistics, has shown that the majority of babies under a year do not recover after the operation of intubation.

I wonder whether the patient with convulsions, whom Dr. Cartin referred to, and who died, really had diphtheria. I am merely suggesting this for the purpose of discussion. Is it not possible that this was a case of laryngismus stridulus?

My experience in regard to intubation in scarlet fever is that scarlet fever does not offer a fair prognosis for intubation. Cases of scarlatinal laryngitis are of the phlegmonous type; the membrane descends rapidly, producing a fibrous exudate all through the bronchial tree, terminating in pneumonia. They are unfavorable cases for intubation.

Should we accept categorically the statement that we should operate early, before symptoms have become severe? I can readily imagine that in rural practice operation should be performed on the slightest indication, but in hospital practice I think it will be permissible to delay operation until there is severe dyspnea, with manifest retraction of the thorax, and with accompanying cyanosis and other definite signs.

Concerning the use of force in introducing the tube, an operator should be very gentle. Force is very likely to cause perforation of the larynx or ulceration. This means severe complications, possibly death.

DR. LAWRENCE T. ROYSTER, Norfolk, Va.: There is a vast difference between intubation in a hospital and outside. To a man like myself, trained in the Willard Parker Hospital, where intubation received its first impetus, going out into private practice and performing intubation on a patient when we do not know whether or not we will ever see that patient again, is a serious thing.

It seems to me Dr. Cartin has secured a remarkable series of statistics. I do practically all the intubation in my section —in the city itself, and from twenty to thirty miles around the city—and yet I rarely see more than seven or eight cases during the winter. Undoubtedly, when one is not in the city, but goes miles into the country, one had better err by performing intubation where it is not necessary, rather than delay until it is too late. My cases have averaged perhaps seven or eight a year for eighteen years. I have had two deaths; one in a child under 1 year of age. Two days after intubation the mother picked it up, and, in a moment of pleasure at its improved condition, tossed it into the air, and it fell back dead. The other was in a case with deformity of the larynx.

He who uses force does not know how to intubate. A man who has never put in a tube, if in doubt had better do a tracheotomy than an intubation.

As to early intubation, the watchfulness Dr. Abt speaks of is entirely proper under trained observers. Only two of my patients were with trained nurses, and the period of intubation in all of them has averaged five days, with not a single reintubation, except in the case with the deformed larynx. I prefer the supine position.

DR. HENRY J. CARTIN, Johnstown, Pa.: I disagree with Dr. Whitney about the use of force. I must confess that I have never used any position except the dorsal, being trained in that position only. I believe the chronic tube cases depend entirely on one condition, and that is trauma on the first intubation, or trauma occurring on reintubation. As to the case of convulsions with laryngeal diphtheria, there is some force to Dr. Abt's reasoning. The family, however, were noted in their neighborhood for having convulsions at any time.

As to early operation, of course I had particular reference to a practice in communities in which hospital facilities are lacking. In a number of sad cases in which I procrastinated for even an hour or two, I returned to find crape on the door.

A CASE OF HEMIHYPERTROPHY WITH INCREASED SUGAR TOLERANCE*

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There are no reports of cases of hemihypertrophy in the literature until the beginning of the nineteenth century. In 1869 a treatise was published in which

Fig. 1.—Hypertrophy of right leg and foot.

twelve cases were cited. In 1897 LeBlanc collected reports of seventy-eight cases, giving a summary of their features and suggesting a theory as to their causation. Recently Fortescue-Brickdale reported an interesting case.

According to Adams there are two types of this condition — the true hypertrophy, which is always congenital and unilateral and not associated with other deformities, and the false hypertrophy, which may or may not be congenital. The hypertrophy involves all the tissues, but more so the soft parts. It affects the girth more than the length. The right side is more

* From the Medical Service of Dr. O. M. Schwerdtfeger, German Hospital and Dispensary.

often involved than the left, and the lower extremity more frequently than the upper. Seldom is there a family history of any congenital deformity.

REPORT OF CASE

History.—Man, aged 56, tailor, married, no children, was admitted to the medical division of the German Hospital, complaining of a throbbing sensation in the abdomen. There was also a feeling of discomfort in the back of the neck and lower extremities. These symptoms had been present for the past eight years, becoming more pronounced during the past six weeks, so that he was forced to give up his occupation. The disturbances referred to would invariably occur while the patient was at rest. Strange to say the enormously hypertrophied leg gave him no discomfort whatever. The leg had slowly increased in size from birth to adolescence. There

Fig. 2.—Roentgenogram of right foot.

were never any pains or other sensory disturbances. In fact, the hypertrophied leg had been of greater service to him than the sound limb. The patient was operated on for a glandular tumor of the neck at the age of 18, and had never been sick since. The history was entirely negative.

Physical Examination.—The patient was exceedingly well developed and nourished, and showed no organic disturbances. There were no glandular enlargements or palpable thyroid. The right side of the chest was slightly less developed than the left; the development of the arms was equal, but the right leg from the middle of the thigh down was enormously hypertrophied. The measurements of the right leg as compared to the left were:

	Right Leg, Inches	Left Leg, Inches
Three inches above the patella	18	17½
At the patella	19¾	15¾
Three inches below the patella	18½	14¼
About the ankle	14	8⅛

No tenderness was elicited over the affected leg. A large lipoma was present at the ankle.

Roentgen Examination.—Marked changes were present in the shadows of the outlines of the bones around the knee, ankle, tarsal articulation and tarsal phalanges. The process was characterized by extensive production and deformity. The head of the first metatarsal and phalanges of the first toe, as well as the soft parts, showed great production and deformity almost to the extent of gigantism. The left leg was normal in all respects. Examination of the chest and head showed no enlargement of thyroid, thymus or pituitary.

Clinical and Laboratory Findings.—The systolic blood pressure was 180; diastolic, 96. The pulse rate was 72 per minute. The blood count was normal in all respects. The Wassermann reaction in the blood and spinal fluid was negative. Analysis of the urine revealed: total nitrogen, 10 gm. in a twenty-four hour specimen; ammonia nitrogen, 6 per cent.; urea nitrogen, 66 per cent. No sugar, albumin or casts were found. Bence-Jones protein was absent.

Chemical examination of the nitrogenous constituents of the blood revealed, per hundred c.c. of blood: nonprotein nitrogen, 21 mg.; urea nitrogen, 10 mg.; uric acid, 1 mg.; creatinin, 1 mg. Sugar as dextrose was 0.1 per cent. The carbon dioxid combining power was 85 volumes per cent. per hundred c.c. of serum. The phenolsulphonephthalein elimination in two hours was 75 per cent.

Gastric analysis showed no retention, free and total acids being present in the usual percentages.

There were no thyroid or thymus disturbances. Injection of one-tenth grain of pilocarpin produced no perspiration, salivation, increased general nervousness or perceptible changes in blood pressure. The instillation of 1 drop of a 1:1,000 epinephrin solution into the eye caused no changes in the pupil. The pulse rate was not affected when the eyeball was pressed. The sugar tolerance test was done as follows: The patient was given 150 gm. of glucose in coffee by mouth twelve hours after the last meal, the urine was tested for sugar in the specimen the following hour, and for the next five hours and in the complete twenty-four hour specimen. The amount was increased 50 gm. daily until 650 gm. had been given at one time. No sugar could be detected in the urine. Following the last test, the sugar content of the blood was 0.088 per cent. For obvious reasons the amount of glucose could not be increased.

COMMENT

Several theories have been advanced concerning the etiology of hemihypertrophy. Among the older hypotheses may be mentioned paralysis of the vasomotor system; arrested development of the different coats of the arteries; intra-uterine meningitis of the brain and cord; faulty development of the cord; enlargement of one side of the cerebrum, and lesions in the central nervous system. More recent views ascribe the condition to some alteration in the character of the internal secretions — possibly a hyperpituitarism. Numerous postmortem findings fail to establish a definite cause.

152 East Eighty-First Street.

Care of Expectant Mothers.—The New York Milk Committee has recently published a report on the care of expectant mothers covering its work for the past four years; 3,145 expectant mothers were enrolled and given care and supervision averaging three and one-half months before and one month after confinement; 3,192 babies were born, of which 115 were still birth, and eighty-six others died during the first months after birth. The stillbirth rate per thousand of these cases was thirty-six against forty-six for Manhattan, or a reduction of 22 per cent. The rate per thousand of deaths under one month was twenty-eight against thirty-nine for the borough, or a reduction of 28 per cent. Out of this whole group of mothers only five died, giving a rate of 1.5 per thousand mothers against a rate of 4.9 in the city at large.

THE SURGICAL SIGNIFICANCE OF GASTRIC HEMORRHAGE *

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From a surgical standpoint, hematemesis is caused by, or occurs with, first, primary lesions in the stomach and duodenum, such as ulcer, cancer, tuberculosis, syphilis and benign tumors; and second, certain diseases and infections which are not necessarily associated with recognizable changes in the gastric mucosa.

In the first group, namely, those cases in which there is a chronic gastric or duodenal lesion, both diagnosis and treatment are on a relatively satisfactory basis, and the general surgical principles applicable in the treatment of the most common cause of hematemesis in the group, that is, gastric or duodenal ulcer, are more or less accepted. These bleeding ulcers may be conveniently divided into two groups, namely, those ulcers in which there has been a history of bleeding, and those in which active bleeding is taking place.

1. The indications for surgical treatment of the patient with a history of single or recurring gastric hemorrhages in whom a diagnosis of ulcer can be established are positive. It has been our experience that to depend on gastro-enterostomy alone for the treatment of ulcer which has been associated with bleeding is to court recurrence of the hemorrhage, and that to obviate further hemorrhages, excision, preferably by cautery or resection of the ulcer, is imperative.

2. The management of the ulcer which is the cause of continuous, active bleeding has been the subject of considerable controversy. There are no means of estimating the size of the bleeding vessel. As a single gastric ulcer hemorrhage is rarely fatal, the margin of safety usually permits delay until lowered blood pressure has allowed clotting to take place. Death due to hemorrhage from gastric ulcer has usually been the result of repeated hemorrhages at comparatively short intervals. A recurrence of bleeding, therefore, a few days after a serious hemorrhage is more than a sufficient indication for operating during the active hemorrhage, rather than to risk further delay. In repeated or continuous small hemorrhages, which do not threaten the life of the patient, transfusion has proved of the greatest value, not only in controlling the bleeding by the introduction of the necessary elements for clotting, but also adding greatly to the safety of later operative measures for the ulcer.

In the second group of cases of hematemesis, namely, the cases in which there is no surgical lesion in the stomach, a variety of diseases and conditions call for consideration, and they may advantageously be divided into groups as follows:

1. Cases in which there are recognizable changes in the liver or spleen or both; a group in which hepatic cirrhosis and splenic anemia are representative.

2. Cases in which a chronic infective focus, such as a diseased appendix or gallbladder, is apparently responsible for the bleeding.

3. A group which includes, in the main, such acute infections as typhoid, pneumonia, etc.; multiple hemorrhagic erosions; cases in which no changes can be demonstrated either at necropsy or operation, and the cases of "gastrostaxis" of Hale White.

The differential diagnosis of these various groups is not made without difficulty, and the ordinary difficulties are exaggerated by the fact that many conditions such as hepatic cirrhosis, appendicitis, or gallbladder disease are associated with disturbances in gastric digestion, which may easily be misinterpreted as due to ulcer. Hematemesis added to such a syndrome has not infrequently resulted in unnecessary and unsuccessful operations based on an erroneous diagnosis of gastric ulcer.

Hepatic cirrhosis and splenic anemia are relatively often the cause of hematemesis in this extrinsic group, and if one bears in mind the ease with which mucosal hemorrhages take place in these diseases, and the fact that such hemorrhages have the same characteristics as those associated with the other more or less obscure causes in the group, it seems to be suggested that the liver or spleen or both offer a key to the explanation as to the manner in which many, if not all, these mysterious hemorrhages take place.

The close association of the spleen and the liver, both in the normal physiologic and anatomic relationship, and in disease processes, necessitates the most careful consideration of the spleen in all conditions which involve the portal circulation. It must be remembered, too, that the spleen, or liver, or both, may be responsible for gastric hemorrhage, and yet themselves not exhibit any evidences of disease. I recently published the history of a case in which I removed a slightly enlarged spleen, chiefly on an empirical basis, from a patient who had had various operations, mainly gastric, in an effort to find the cause of, and to prevent, gastro-intestinal bleeding. This patient has had no bleeding since the splenectomy. Various writers, particularly Rolleston,[1] have attributed gastric hemorrhage in such cases to a "latent" hepatic cirrhosis.

The treatment by splenectomy of moderately advanced hepatic cirrhosis is as yet in the experimental stage. The disease is usually so slowly progressive that even though the immediate results have been satisfactory we do not feel justified in drawing conclusions from the cases in which we have performed splenectomy. Nevertheless, there appears to be a definite group of so-called primary hepatic cirrhoses produced by toxins originating in, or elaborated in, the spleen. So in those cases in which hematemesis occurs in what might be termed the precirrhotic stage of hepatic cirrhosis, that is, when the cirrhotic changes are scarcely visible either grossly or microscopically, splenectomy may be indicated, if the spleen is large. Under such circumstances the operation may be looked on as probably a curative measure.

It is a significant fact that in those cases of gastric hemorrhage which show only slight erosions in the mucosa of the stomach, micro-organisms may be obtained from the depths of the erosions and the same organisms may be obtained from the spleen (Rosenow[2]); moreover, it has been shown that various forms of encapsulated bacilli will produce gastric and intestinal hemorrhages. These bacteria, although differing in some respects, have one power in common, namely, the power to exert a "specific effect on blood vessels and produce changes in the blood itself." Letzenberg early reported the recovery of the bacillus of Friedländer from hemorrhagic areas in the mucosa of the stomach and intestine of a child dying from gastro-intestinal hemorrhage. We know also that in

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Rolleston, H. D.: Diseases of the Liver, Gallbladder and Bile Ducts, London, Macmillan, 1914, p. 268.
2. Rosenow, E. C.: Personal communication to the author.

certain cases of syphilis associated with anemia, the spleen contains spirochetes in large numbers (Giffin[3]). The liver, deriving as it does a large quantity of its blood from the spleen, has every opportunity for picking up toxins and bacteria from the spleen. Thus the spleen must also be recognized as a possible causative factor, not only of changes in the liver, but directly or indirectly, of gastric hemorrhage.

In recurring gastric hemorrhage in which demonstrable lesions in the stomach or duodenum are not present, and other extrinsic causes have been excluded, the rôle of the spleen should be investigated. It is even possible that in such cases when bleeding is sufficient to endanger the patient's life and when the primary focus of infection is not determined, splenectomy (if the spleen is enlarged) may be an indication by reason of the mechanical influence of lessening the venous return to the stomach.

The group of cases in which there is an obvious focus of infection includes cholecystitis, pancreatitis, salpingitis, tuberculous peritonitis, and appendicitis. In these and other conditions, gastric hemorrhage may occur, and not only is a positive diagnosis usually possible, but treatment as a rule is successful.

Several cases of gastric hemorrhage have been observed in our clinic in which there was well-marked appendicitis, and appendicectomy seemed to show that the appendix had been the primary cause of the bleeding. Moynihan[4] early drew attention to this fact. Eusterman[5] has shown that about 2 per cent. of appendix cases and about 5 per cent. of gallbladder cases with marked reflex gastric symptoms gave a history of previous bleeding. The spleen also may act as a primary focus of infection, although our present knowledge would indicate that it acts rather as a medium through which infection from a distant focus is transmitted to the liver.

The group of cases in which fatal or serious gastric hemorrhage occurs and no cause can be demonstrated has been the subject of much controversy. Unless the primary cause for such hemorrhage is found surgical treatment is not clearly indicated, and the same statement is true regarding those acute infections such as typhoid, pneumonia, and in cases of mucous erosions which are so often multiple and occasionally seen at necropsy.

In reviewing these various groups, there are several facts which strongly suggest that gastric hemorrhage may be produced through the same channel in all, namely, the portal circulation. We know, for example, that hepatic cirrhosis is a frequent cause of hematemesis; that hematemesis is often toxic in origin (Adami[6]); that a large part of the blood of the body is transmitted through the liver; and that toxic foci which are associated with gastric hemorrhage are found, especially in the abdomen. Is it not possible that these various focal infections produce chemical or physiologic changes in the liver, changes which, if the cause is not eradicated, progress to the cirrhotic liver? It would seem further possible that the liver under such circumstances may in some manner sufficiently lower the resistance of the gastric mucosa to permit the bacteria, which are consistently present in both true gastric ulcer and in mucous erosions, and which may reach the stomach either by the blood stream or by the food, to set up those diffuse or localized tissue changes.

In other words, it is probable in many of these gastric hemorrhages in which a primary causative focus is established, that the conditions which result in hematemesis are largely under the control of the liver; and since the spleen is so intimately concerned in the functions of the liver, it, too, must be looked on as an important factor.

RECAPITULATION

It should be emphasized that the surgical significance of gastric hemorrhage demands:

1. The proof that a gastric hemorrhage has taken place.
2. The determination and eradication of the originating cause, whether chronic surgical lesions in the stomach, or extrinsic foci.
3. The treatment of the hemorrhage per se, the general indication being to carry out operative treatment during the interval between hemorrhages.
4. The recognition of the possibility that many of the extrinsic causes of gastric hemorrhage are toxic in nature, and that the infection takes place by means of the portal circulation through the liver.
5. That not only is the liver of first importance in these heretofore unexplained hemorrhages, but the spleen, by reason of its close association with the liver, is probably an important factor in the problem.[7]

ABSTRACT OF DISCUSSION

DR. FRED B. LUND, Boston: The recognition that the condition of the spleen may be of importance in repeated acute gastric hemorrhages seems to me destined to be of distinct value. I do not know anything more worrisome to the surgeon than to be called to a case of acute gastric hemorrhage at a distance in the country—a case that has not been studied, or blood examinations made—where he is tempted to employ operative measures to stop the hemorrhage. I have learned that it is poor practice, when the patient is depleted by hemorrhage, to open the stomach and try to grasp the artery in the bottom of an ulcer; also, when hemoglobin is down to 20 per cent. to try to do extensive resection is foolish. Even if the patient dies of hemorrhage, he is more sure to die if we operate than if we let him alone, and the majority of hemorrhages are not fatal. Even the question of a transfusion ought to be put off for a time, because one does not want to increase the blood pressure. The cases most benefited by transfusion are repeated small and frequent hemorrhages from a gastric ulcer. In these cases we must never forget extrinsic causes.

DR. DONALD C. BALFOUR, Rochester, Minn.: I wish to thank Dr. Lund for drawing such particular attention to the treatment of gastric hemorrhage per se. That is a subject worthy of a separate paper. I have desired to emphasize the possibility that many of these mysterious hemorrhages are more or less directly concerned with the liver and the portal circulation, and that the spleen, though it may possibly be a focus of infection, is more likely a medium through which the necessary infection takes place to produce gastro-intestinal hemorrhage.

3. Giffin, H. Z.: The Treatment by Splenectomy of Splenomegaly with Anemia Associated with Syphilis, Am. Jour. Med. Sc., 1916, **152**, 5-16.

4. Moynihan, B. G. A.: Appendix Dyspepsia, Brit. Med. Jour., 1910, **1**, 241-244.

5. Eusterman, G. B.: Incidence and Diagnostic Value of Blood or Hemorrhage in Gastric and Intestinal Lesions, a Clinical and Statistical Study, St. Paul Med. Jour., 1913, **15**, 587-593.

6. Adami, J. G., and Nicholls, A. G.: Principles of Pathology, Philadelphia, Lea and Febiger, 1909, **2**, 408.

7. In addition to the references cited in the text, the following will be found of interest:

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Clinical Notes, Suggestions, and New Instruments

A SAFETY CAP FOR GRADUATED PIPETS*

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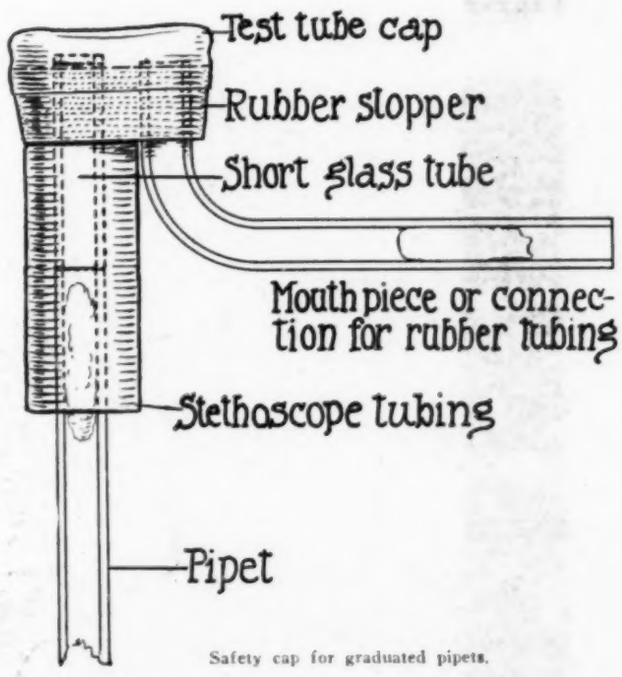
A certain number of laboratory infections are traceable to the handling of pathogenic micro-organisms in pipets which are filled by suction with the mouth and emptied gradually by the admission of air under the ball of the finger. Such accidents may occur either from infection of the end of the pipet by a contaminated finger or from sucking organisms into the mouth, an occurrence against which cotton plugs are not a sure protection.

Rubber bulbs and other simple vacuum and pressure devices are not sensitive enough for use with graduated pipets when accurate control of the meniscus is desired. Even when carefully handled, the elasticity of the contained air is a disturbing factor.

With semifluid cultures also, such as are used in the cultivation of spirochetes, the negative pressure of a collapsed



Safety cap for graduated pipets.

rubber bulb is not sufficient to cause the medium to be forced into a capillary pipet.

The safety cap illustrated herewith obviates the danger mentioned, and yet gives accurate control of the delivery of liquid from the pipet. It consists of a section of two-hole rubber stopper (No. 0 or 1), 1 cm. thick, over which a flat rubber test tube cap[1] is slipped. It may be cemented in place, although that is not necessary. An L of glass tubing forms an easily sterilized mouthpiece, which may be further safeguarded by a cotton plug.

Two cotton plugs and the space in the cap are almost a sure protection against the aspiration of liquid. Connection with the pipet is made by a stub of straight glass tube, which projects into the cavity of the cap and carries a short length of heavy rubber stethoscope tubing. This is more elastic than a rubber stopper, and admits various sizes of pipets.

To give a stiff resistance to pressure from above, the pipet should be pushed into contact with the short glass tube. The finger, pressing the smooth, thin rubber cap down on the end of this tube, controls the delivery of liquid with perfect sensitiveness. Fractions of a division on the pipet may be measured, and the column of liquid is obedient at any speed of delivery.

If from strong suction in filling the pipet the cap tends to collapse over the glass tubes it may be held away by pressure of the forefinger against its rounded edge.

An additional advantage of the safety cap is that the pipet is held at an angle with the line of vision, so that the meniscus is easily visible as it rises in the bore. When several pipets are in use at one time, it is convenient to fit each of them with a cap.

*From the Department of Pathology and Bacteriology, the Rockefeller Institute for Medical Research.

1. Eimer and Amend: Catalogue C, Fig. 6026, ¾ inch.

LIQUID AGAR-AGAR IN CONSTIPATION

ORVILLE HARRY BROWN, M.D., AND WILLIAM OSCAR SWEEK, M.D.,
PHOENIX, ARIZ.

Constipation may be caused by any one of a number of factors. In certain cases it is imperative that a tumor be removed, that adhesions be destroyed, or that other maldevelopment be eliminated before the desired improvement can be obtained.

As constipation increases in severity, there is a tendency for the development of a vicious circle. The longer fecal material lies in the colon, the more inspissated it becomes, and hence the less likely will an ordinary peristaltic wave dislodge it. As fecal material accumulates in the colon, the weight drags the colon lower and lower. The feces become molded to the wall of the bowel and fail to stimulate to peristalsis.

Even in those cases in which there is a definite mechanical constriction of the lumen of the bowel, some good may be expected by keeping the fecal material soft. To do this, agar-agar has been used with noteworthy success. It works by absorbing water and softening the bowel contents; it is indigestible. In the main the agar has been administered with breakfast foods, sauces, etc., by simply mixing the dry powder or shreds with the food.

It occurred to each of us that if liquid agar were taken into the body, greater good might occur. In order for agar to be liquefied, it must be boiled in water, usually for ten minutes or longer. But it stays liquid until cooled almost to blood temperature; and then it is gelatinous until cooled a number of degrees below body temperature. Therefore if the agar is taken into the stomach while liquid, the body heat will prevent it from solidifying past the jelly stage. We reasoned that if a sufficient amount of the liquid agar were taken, and with enough water, the feces would be softened more efficaciously than when the same amount was taken dry.

The taste of the liquid agar, slightly flat and insipid with perhaps a little musty suggestion, is as a rule not disagreeable; but to some its taste is highly displeasing. To mask the taste, we have advised various procedures. Taste is an individual matter, and hence the preparation pleasing to one may be disagreeable to another. In order to hope for benefit from the use of the agar, it must be prepared so palatable that the patient will willingly take it in sufficient quantity, frequency and duration.

The directions we ordinarily give for its preparation are as follows:

Take 2 heaping tablespoonfuls of the agar powder, flakes or shreds; add to 1 quart of water and boil till the agar is thoroughly liquefied; sweeten and add juice of one lemon; then drink the entire quart while hot.

A quart is a considerable quantity of liquid for some persons to consume in the course of a few minutes. Heating the agar over or preparing smaller amounts several times a day is a laborious task. We have met this problem by having the patient provide himself with a quart vacuum bottle. The quart of hot agar lemonade can be prepared in the morning, poured into the vacuum bottle, and taken leisurely during the day. We have become convinced that the material is most efficacious when taken between meals.

We have had patients make use of orange, grape fruit, vanilla, maple or other flavoring in place of the lemon. A coffee, chocolate or tea may be prepared and be most pleas-

ing. Again a bouillon agar may please. We have one patient who preferred to take the hot agar with only a pinch of salt added. Another takes it cooked with a cereal; this should not be allowed to cool before it is eaten.

As each patient has his own idiosyncrasies as regards taste, he will be disposed to guide the flavoring of the agar.

The liquid agar will not have its beneficial effect usually until used several days. Commonly, however, some good will be apparent within a week if a quart of hot agar is taken daily. At the end of a few weeks, it may be that a tablespoonfull of the agar or even less to a quart will suffice for the day's supply.

In case the 2 tablespoonfuls of agar to a quart of water daily is not productive of benefit within two weeks, the amount of agar should be increased. We have had patients who took more than double this amount before good results were obtained. We have had a very few who have apparently used the agar faithfully and yet have received no benefit.

SUMMARY

We recommend agar-agar for constipation; it seems to be most efficacious when taken hot. It is most readily taken as a hot lemonade, chocolate or bouillon. Other therapeutic measures directed at the removal of mechanical obstructions should also be employed.

Special Article

AT FORT OGLETHORPE

The medical officers at Ft. Oglethorpe, Ga., believe that the War Department merits special praise for selecting that place for their training camp. Many of the physicians from the Eastern and New England States, who were dreading the ordeal of spending a summer in the Southland, are now sympathizing with their less fortunate brethren who are detained in the hot northern cities. The customary morning greeting here is, "How many blankets did you require last night?"

The camp is located in beautiful Chickamauga Park. It is a veritable gold mine of historic interest. There are scores of monuments on every hand, which relate the stories of valor and bloody struggles of the days of Sixty-Three. Occasionally one is surprised to find how much fighting can be done without large casualty lists. One of the officers ran across a monument erected to a battery of artillery, which bore an inscription relating how it fought for twelve hours before it was compelled to retire, and suffered a loss of one man wounded, and one mule killed.

Instructors and Student Officers.—This rank has no reference to the rank held by the men in the service, but is given hats are captains in the student officers' companies. The first and second lieutenants are indicated by white badges over

Front Row, Left to Right: 1. First Lieut. Llewellyn Powell; 2. First Lieut. Allen H. Walker; 3. First Lieut. Richard S. Spahr; 4. First George M. Piersol; 9. Capt. Thomas R. Chambers; 10. First Lieut. Charles S. Flagler; 11. Capt. James F. Coupal; 12. First Lieut. Conrad Alexander D. Parce; 18. Capt. Calvin D. Cowles, Jr.; Major Raymond C. Turck; 20. Lieut.-Col. Henry Page, M. C.; 21. Major Roger Brooke, M. C. Walter R. Weiser; 28. First Lieut. Damon B. Pfeiffer; 29. Major William Pepper.—Second Row: 1. Capt. Albert E. McEvers; 2. First Lieut. Roscoe 7. First Lieut. Edward D. Ellis; 8. Capt. Richard Hirsch; 9. First Lieut. William H. Barrow; 10. First Lieut. Arthur R. Weed; 11. First Lieut. Devron; 16. First Lieut. Robert E. Siebels; 17. Capt. Frank Fogle, 9 M. Corps; 18. Capt. Dunning S. Wilson; 19. First Lieut. William W. Jarrell; Lieut. Eugene J. McCarthy; 25. Capt. Henry S. Beckford; 26. Major George F. Keenan.—Third Row: 1. First Lieut. Theodore Le Boutillier; 2. First 7. Capt. Elliott Edie; 8. First Lieut. George Dorsey; 9. First Lieut. Widner E. Doremus; 10. First Lieut. T. Z. Cason; 11. Capt. William E. Butler; Lieut. Henry T. Nicolle; 17. Capt. Eugene Davis; 18. First Lieut. Frederick J. Quigley; 19. First Lieut. Gustave P. Grabfield; 20. First Lieut. William 25. First Lieut. Charles J. Cole; 26. First Lieut. William H. McLain; 27. Capt. John T. Halsell; 28. First Lieut. Thomas V. Williamson; 29. First

Every man is beginning to realize that it requires more than a thorough knowledge of medicine to make a competent military surgeon. The work is made easier and the attention of the men held more firmly by giving map readings, war games, etc., connected with the various battles fought in this vicinity, among which are the battles of Missionary Ridge and Lookout Mountain. The latter was the first battle ever fought above the clouds. Field hospital, ambulance companies and regimental units are formed and men assigned to work in them, which is a great factor in the training. Everyone knows that actual experience is a much better teacher than all the correspondence schools combined.

From the smallest town practitioner to the nationally known surgeons who are here, no one would forego the opportunities afforded of playing a part in the greatest drama the world has ever staged. The enthusiasm and spirit shown in performing the duties assigned is something to be marvelled at. Every day spent here is an epoch in a man's life. An example from the many that could be given is the review held here a few days ago in which probably the greatest number of military surgeons ever assembled at one place were on parade.

Home talent vaudeville shows, golf tournaments, medical societies, etc., are among the many things arranged for the recreation of the men during their off hours. Their comforts are well provided for, and if war had no greater hardships than they are undergoing at the present time, it is to be feared that the civilian population would be in dire need of physicians, as there would be nothing but military surgeons. Many of the men have brought their families, and each week end is filled with teas, dinner dances and other social gayeties.

The health of the men is excellent, and about the only things the camp surgeon has had to treat thus far have been minor ailments, associated with healthful recreation.

The following is a list of the men at Fort Oglethorpe on August 1:

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Sprague, Charles H., Bridgeport
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to student officers to indicate that they have obtained proficiency along certain lines. Those wearing white bands on their the left pocket and by red badges which do not show in this picture.

Lieut. J. Harry Collins; 5. First Lieut. Guy B. Denit; 6. First Lieut. John T. MacDonald; 7. First Lieut. William E. Wilmerding; 8. First Lieut. Wesselhoeft; 13. First Lieut. Russel R. Jones; 14. First Lieut. John A. Rogers; 15. Capt. David W. Parker; 16. Capt. Royal Reynolds; 17. Capt. 22. Major Robert L. Carswell; 23. Major Seartus J. Owen; 24. Major Bial F. Bradbury; 25. Capt. Mahlon Ashford; 26. Capt. Howard Fox; 27. Capt. L. Perkins; 3. First Lieut. Fred H. Bloomhardt; 4. First Lieut. William Bates; 5. Capt. Frank R. Maura; 6. First Lieut. Charles W. Comfort, Jr.; Henry F. Sawtelle; 12. First Lieut. Joseph R. Helff; 13. First Lieut. Newgate M. Owensby; 14. Capt. Elias M. Duffield; 15. Major John A. 20. First Lieut. James R. Wells; 21. First Lieut. Robert A. Kilduffe; 22. First Lieut. Walter B. Martin; 23. First Lieut. Ivy A. Pelzman; 24. First Lieut. Don Preston Peters; 3. Capt. William W. Babcock; 4. Charles E. Maxwell; 5. Capt. Edward J. G. Beardsley; 6. First Lieut. G. C. Tillman; 12. First Lieut. James J. O'Connor; 13. First Lieut. John H. Musser, Jr.; 14. First Lieut. Burr Ferguson; 15. First Lieut. John A. Farrell; 16. First A. Newbold; 21. First Lieut. Henry P. Brown; 22. First Lieut. J. R. Huduall; 23. First Lieut. Frank Freeland; 24. First Lieut. Deslia H. Harris; Lieut. Charles H. Fait; 30. First Lieut. Edward A. Pitcairn.

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SATURDAY, AUGUST 11, 1917

THE EFFECT OF STARVATION ON INTESTINAL BACTERIA

The prevalence of micro-organisms in the alimentary canal is a well recognized feature of the manifestations of the digestive functions. It is generally known that much of the dry matter of the feces consists of the bodies of bacteria, most of which are dead. How large a contribution to the excrement is furnished by those micro-organisms that have found their way into the alimentary tract, or have been developed within it, cannot readily be estimated. As might be expected from the varying nature of the diet of adults, carrying with it quite unlike amounts of indigestible matter, the admixture of bacterial bodies must be widely different under different regimens. When one reads, in the textbooks, that probably about one third of the dry substance in the stools of normal adults is bacteria, it must be borne in mind that the statistics reported by different investigators range from 9 to 42 per cent. It is even stated that in infants with pronounced constipation two thirds of the dry substance of the feces has been found to consist of bacteria. In some cases over 50 per cent. of the total nitrogen of feces has been reported to be of bacterial origin.[1]

There has been considerable discussion concerning the factors which may alter the character of the intestinal flora; and the possible effects of changes in diet in this respect have been reviewed from time to time in The Journal. Less information is available regarding variations in the number of micro-organisms that inhabit the alimentary tract. The bacteria-free condition in which this starts its functions prior to the discharge of the meconium after birth is soon followed by a practically permanent state of bacterial invasion to the very end of life. The hope of effecting a sterilization of the long gastro-intestinal canal has often been awakened, only to fade away before the realization of the impossibility of accomplishing such a result without destruction to the living tissues amid which the micro-organisms are harbored.

1. MacNeal, Latzer and Kerr: Jour. Infect. Dis., 1909, **6**, 123. Blatherwick, Sherwin and Hawk: Jour. Exper. Med., 1911, **14**, 433. Blatherwick and Hawk: Biochem. Bull., 1913, **3**, 28.

The output of fecal bacteria has been found to undergo a decrease under the influence of water drinking with meals.[2] In animals, Cushing and Livingood[3] found that, after a period of twenty-four hours' starvation, a relative amicrobism of the small intestine results. This has been verified recently by Sisson[4] in the Department of Pediatrics and Bacteriology, Johns Hopkins University. Examination of the intestinal contents after periods of starvation shows definite changes in the number of organisms, contrasting with the profusion of bacterial growth normally found. Changes in the kinds of organisms persisting after periods of starvation were not noted. The greatest diminution was observed in the duodenum; in some instances, however, but few organisms were present in the contents of the ileum. The contrast between the paucity of organisms at this level and the large number present in the cecum was striking. Although the number of organisms is, to a great extent, dependent on the food residue present, absolutely sterile specimens were never obtained, even after the food residue was undoubtedly absent. Thus the condition produced by starvation is, as Sisson expresses it, one of relative amicrobism.

FOOD POISONING, WITH SPECIAL REFERENCE TO BOTULISM

There are but few persons who have not suffered from more or less severe attacks of acute gastro-intestinal disturbance which could be reasonably ascribed to something eaten shortly before. By far the most of such attacks are mild and quickly overcome, and it is only when the attack is serious and affecting many persons at the same time that it attracts particular notice, and becomes perhaps the subject of public record. In his valuable little book on food poisoning, Jordan[5] points out that as cases of food poisoning are not required to be reported, we possess only imperfect information as to its occurrence, casual press reports being the only available source of information as to its prevalence. Through press-clipping bureaus and other sources, from October, 1913, to October, 1915, Jordan learned of 657 group and family outbreaks and 375 individual cases in this country. The group and family outbreaks involved over 5,000 persons. He believes that at present probably the majority of instances escape notice and that the number of persons affected by food poisoning in the United States in the course of a year is much larger than indicated by the figures he obtained. Until we have a larger amount of dependable data, any

2. Mattill, H. A., and Hawk, P. B.: Jour. Am. Chem. Soc., 1911, **33**, 1999. Blatherwick, N. R., and Hawk, P. B.: Biochem. Bull., 1913, **3**, 28.

3. Cushing, H., and Livingood, L. E.: Contributions to the Science of Medicine by Pupils of Welch, 1900, p. 543.

4. Sisson, W. R.: Experimental Studies of the Intestinal Flora, Am. Jour. Dis. Child., February, 1917, p. 117.

5. Jordan, E. O.: Food Poisoning, University of Chicago Press, 1917.

general conclusions of value as to the exact causation, frequency, and immediate and remote results cannot be drawn. As ordinarily understood, food poisoning is due to the composition, contents or contamination of food. It includes intoxication by organic poisons in normal animal or plant tissues; the results of eating food into which poisons, mineral or organic, have been introduced by accident or in order to improve the appearance or keeping qualities; infections from the ingestion of bacteria and other parasites present in foods, the most important food-borne bacterial infections being typhoid fever, cholera, tuberculosis, paratyphoid infections and milk-borne diseases, such as diphtheria, scarlet fever and streptococcus sore throat; and poisoning due to the development of toxic substances in food by the growth of bacteria and other micro-organisms.

At this time, when domestic canning of vegetables is being taken up on a large scale, it may not be without interest to mention some of the chief facts known about botulism, the best established form of poisoning by means of toxic bacterial products in food. This poisoning was described in 1820 by Kerner, German poet and medical writer, who cited 174 cases with seventy-one deaths, in most instances connected with the use of smoked sausage (hence the name botulism, from *botulus*, sausage). Paratyphoid infections may be conveyed by sausages also, and such infections must be distinguished from botulism, which has a characteristic set of symptoms and a distinct cause. Quite a number of instances of botulism have been recorded in this country, and traced to ham, beans and other foods, so that the name "sausage poisoning" is hardly appropriate any longer. In botulism the nervous system is strikingly involved. Dizziness, double vision, difficulty in chewing and swallowing, and other nervous symptoms occur; there is no fever, and in contrast with the traditional type of food poisoning there may be only slight or no gastro-intestinal symptoms. Stiles[6] thus describes his own attack, most likely due to minced chicken:

> Vertigo and nystagmus developed [a few hours after eating] in a startling degree, the car [in which I was being taken to my house] seemed to be ascending an endless spiral, the stars made circles in the sky, and the houses by the wayside reeled. The lighted doorway of my house seemed to approach and surround me as I was carried in. My bed for the moment presented itself as a vertical surface which I could not conceive to be a resting place. . . . Whenever I opened my eyes on this day [the next day] the impression of gyration of the room was appalling. . . . To turn my head even very slowly from one side to the other brought an accession of the overpowering giddiness. . . . [Eight days after the beginning of the attack] the nystagmus now became limited to momentary onsets, but in its place I became aware of a peculiar diplopia. The image of one retina was not merely displaced from the position of its fellow, but was tilted about 15 degrees from parallel. . . . This fantastic diplopia gradually gave place to the familiar variety, and this occurred less and less often as my convalescence proceeded. From [this date] my recovery pursued a course which was disheartenningly slow, but free from any setbacks. Among the persistent symptoms were . . . the visual difficulties mentioned. The left pupil was usually smaller than the right, and I thought I detected a slight failure to relax accommodation with the left eye. Reading was difficult for several weeks, and the ability to write, as requiring closer fixation, was still longer in returning.

The interval between eating the guilty food and the onset of symptoms usually is from twelve to forty-eight hours, but may be less. There are no distinct changes in the organs, the nervous symptoms being perhaps explainable as due to disturbances of the cerebral circulation with hemorrhages and thromboses in medulla and pons.[7] The botulism poison is a toxin produced by the spore-bearing bacillus discovered by Van Ermengem and named by him *Bacillus botulinus*, a strict anaerobe, which does not grow in the human body, being limited in its pathogenic rôle to the toxin it develops in foods outside the body. Hence botulism is a strict intoxication, not an infection. We do not know anything about the distribution of this bacillus in nature. Its poison is a true bacterial toxin, which reproduces the clinical picture of botulism in animals, and when injected in small nonfatal doses it evokes the elaboration of a specific antitoxin. The bacillus apparently is widely distributed, but it seems as if the conditions for its entrance and multiplication in human food are not often present. Jordan states that practically all cases of botulism have been caused by food which has been given some sort of preliminary treatment, as smoking, pickling or canning, then allowed to stand for a time, and eaten without cooking. The growth of the bacillus in a food does not necessarily alter it in such a way as to arouse suspicion; meat that has caused botulism seems to have always come from sound animals, and beans causing botulism have also been noted as natural in appearance, taste and smell. It seems that meats and vegetables prepared in the home are more likely to give rise to botulism than those prepared in large canning factories in which steam under pressure is used. It would be a wise precaution always to heat thoroughly the food in canning and to reheat all prepared foods before eating, because *B. botulinus*, its spores and its toxin are destroyed by relatively slight heating. Foods like salads should not be allowed to stand over night before being served. When visual disturbances and other symptoms of botulism appear, the stomach should be emptied and cathartics given, because the poisoned food may remain for a long time in the digestive tract.

We probably have much to learn still in regard to the causes, varieties and symptoms of food poisoning. It would not be surprising if careful clinical study of cases would result in the differentiation of new forms not yet recognized as distinct. The progress of knowl-

6. Stiles, P. G.: A Case of Apparent Food-Poisoning of the Type Known as Botulism or Allantiasis, THE JOURNAL A. M. A., Dec. 27, 1913, p. 2301 (cited by Jordan).

7. Wilbur, R. L., and Ophüls, William: Botulism, Arch. Int. Med., October, 1914, p. 589.

edge of food poisoning would be furthered greatly if it were made reportable to our health authorities; this would lead to closer investigation, which eventually would result in better means of treatment and prevention.

NO NEED FOR DRAFTING THE MEDICAL PROFESSION

It is to be regretted that there has been so much hysteria in regard to procuring the medical force of the new National Army. It is still more to be regretted that this hysteria—absolutely undeservedly—has reflected unfavorably on the medical profession. As late as August 1 the Associated Press sent out a statement to the effect that a petition was being circulated which

> declares that the method of recruiting the Medical Corps of the Army by commissioning reserve officers in that Corps who volunteer has proven a failure and asks that in behalf of the welfare of the nation a draft for physicians be made.

This is merely an echo of what many men with the best motives have advocated. It is based on the assumption that the newspapers have had correct figures regarding the number of men who have accepted commissions in the Medical Reserve Corps, and that the medical profession was not responding to the call. Even within the last two weeks, statements have appeared in the newspapers, apparently from authoritative sources, to the effect that less than 3,000 physicians have accepted commissions in the Medical Reserve Corps.

What are the facts? On August 4 approximately 16,000 physicians had offered their services and had made application for commission in the Medical Reserve Corps. Of this number, nearly 14,000 had been recommended for commission. Some of the remaining 2,000 applications were pending; others had been rejected for cause. Of the 14,000 commissions recommended, nearly 9,000 had been accepted. This leaves about 5,000 applications which may be accounted for as follows: 1,300 were pending in the Adjutant-General's Office; an uncertain number had been sent out too recently to allow for the acceptance to be returned; some who had received commissions were delaying — for various causes — in sending in the acceptances. What proportion of this group will finally accept their commissions is problematical; but based on information which we believe to be reliable, we confidently assert that there are at the present time at least 13,000—probably 14,000 is nearer the correct number—physicians ready when called on for active service. These figures do not include physicians who have entered the regular Medical Corps during the last few months, or those connected with the National Guard, the latter at least 1,000 in number. Moreover, from 100 to 150 new applications are reaching the Surgeon General's Office daily. To advocate a special draft of physicians under these circumstances is an insinuation against the medical profession which should be insistently resented.

We repeat: The physicians of this country have been and are offering their services, at tremendous sacrifices in many instances, and are doing their full duty without compulsion and without a special draft. We are confident that not only the present, but every future need which the country may have for medical men, will be supplied by our profession, without coercion or threats.

BIOCHEMICAL RELATIONSHIPS IN METABOLISM, PARTICULARLY IN RESPECT TO CHOLESTEROL

In speaking of what he naively calls the world of biochemical fact and error, von Fürth[1] says, "Not without feelings of decided rebellion, at a single stride the darkly yawning chasm of intermediate metabolism must be passed, with the vast number of unsolved enigmas it harbors, and attention directed to the end-products of metabolism." Among these problems, for example, is the question as to what extent definite organs are especially concerned with specific metabolic performances. For a long time the function of urea production was ascribed almost solely to the liver, and many attempts were made to demonstrate that a perversion of the hepatic activities would be indicated by inability of the organism to produce urea. Decrease in urea output, to be sure, was sometimes found associated with liver disease; it is clear now, however, that this outcome was due, not to inability of the body to synthesize urea, but to the "deflection" of nitrogenous end-products of metabolism for the formation of ammonia to counteract the acidosis of hepatic disorders. It is understood that the liver can be largely excluded from normal functioning without a disappearance of the urea-producing capacities of the body. Presumably urea formation is a fairly common property of active cells — a reaction prominent in the liver because of its dominant glandular features, but no more confined to that organ than the fundamental capacity of oxidizing nutrients appears to be.

It is a true factor of safety for the organism that significant biochemical reactions are not easily perverted in the body even when it is invaded by disease. The tendency of these reactions is to proceed in a normal way as far as possible. So far as nitrogenous metabolism goes on at all, amino-acids tend to be utilized and urea tends to be produced. Organs of digestion or excretion may become impaired; an imperfect circulation may fail to bring oxygen in adequate measure or remove carbon dioxid and other metabolic products; but the intermediary processes go on with

1. Von Fürth, Otto: Chemistry of Metabolism, translated by A. J. Smith, Philadelphia, 1916, p. 97.

an almost unexpected precision of reaction, making anomalous products a decided rarity.

Bloor and Knudson[2] have recently expressed the same idea, asserting that the metabolic habits of the individual are not easily upset even by severe disease. In illustration they cite their findings in respect to the constancy of relationship between free and bound cholesterol in the blood, even in many pathologic conditions. The blood contains both cholesterol and its esters with fatty acids; the latter now appear to be almost as generally distributed in the body as the cholesterol itself. Bloor[3] has suggested that there is some connection between cholesterol and fat metabolism. In their most recent observations on the constant relation or balance between free cholesterol and cholesterol esters, and likewise between these esters and other blood lipoids, not only in normal human blood but also in many pathologic cases, Bloor and Knudson[2] find added support for the assumption previously made that cholesterol participates in an active degree in the metabolism of fats. In any event there is evidently an efficient regulation of the lipoids, permitting little variation from normal relationships even in abnormal conditions. The same is true of many other blood constituents.

In view of the interest lately aroused in the problems of the biochemical occurrence of cholesterol, reference may be made here to estimations by Denis[4] of the content of this compound in the blood of many persons suffering from a variety of more common diseases. Among the pathologic conditions examined, hypercholesterolemia was found to exist only in diabetes, and in a relatively small number of cases of this disease. Low cholesterol values are not characteristic of any special pathologic condition, but are invariably found in conditions in which marked prostration or cachexia exists. Denis asserts that cholesterol determinations in the blood are therefore at present of no value in the clinical diagnosis or prognosis of disease. Perhaps it is too soon, however, to accept this as a final dictum in the absence of more searching experimental inquiries.

2. Bloor, W. R., and Knudson, A.: Cholesterol and Cholesterol Esters in Human Blood, Jour. Biol. Chem., 1917, **29**, 7.
3. Bloor, W. R.: The Distribution of the Lipoids ("Fat") in Human Blood, Jour. Biol. Chem., 1916, **25**, 577; The Lipoids ("Fat") of the Blood in Diabetes, ibid., 1916, **26**, 417.
4. Denis, W.: Cholesterol in Human Blood under Pathological Conditions, Jour. Biol. Chem., 1917, **29**, 93.

Sanitation in the Dutch West Indies.—In 1916 the Dutch government sent a specialist to Curaçoa, one of their colonies in the Caribbean region, to study sanitary conditions. A public health department at Willemstad has been the result of his visit; steps have been taken to clean the streets daily, to eradicate mosquitoes, to lessen and prevent the spread of venereal diseases by building a hospital for their treatment, and a well equipped bacteriologic laboratory has been established. A quarantine law modeled after the American measures in Panama and at gulf ports has also been passed. According to the report of U. S. Consul George S. Messersmith, Curaçoa (*Commerce Reports*, July 17, 1917), the general health of the colony was good during the past year.

Current Comment

MEDICAL STUDENTS AND CONSCRIPTION

In our issue of July 28 we called attention to the fact that no provision had been made by the War Department whereby medical students would be enabled to complete their medical training, and requested that all students send the facts regarding their draft numbers and numerical order of their call. A double postal card was also mailed to all students whose home addresses were available. There were all told 13,764 medical students enrolled during the last session, of whom 3,379 graduated, leaving 10,385, made up of 4,107 freshmen, 3,117 sophomores, 2,866 juniors, and 295 seniors who were not graduated. Tabulated statistics regarding 5,909 or 56.9 per cent. of all undergraduate medical students are as follows:

Class	Total Replies	Total to be Drafted		First Call		Second Call		Later Calls		Age Exempt	Aliens	Enlisted
		No.	%	No.	%	No.	%	No.	%			
Freshmen....	2,016	1,579	78.3	412	26.0	283	20.3	884	55.9	384	14	39
Sophomores.	1,935	1,697	87.7	460	27.1	347	20.4	890	52.4	204	11	23
Juniors.....	1,458	1,356	93.0	418	31.2	275	20.3	663	48.1	77	6	19
Seniors.....	201	193	96.0	77	39.8	40	20.7	76	39.3	7	1	..
Not stated...	299	228	72.9	99	43.8	34	14.9	95	41.6	57	..	14
Totals.....	5,909	5,053		1,466		979		2,608		729	32	95
Percentages..	.....	85.5		29.0		19.4		51.6		12.4	0.5	1.6

This table is based on the replies received up to the time of preparing for the press. The replies are still pouring in. While the table represents only a little more than 56 per cent. of the whole, it gives those interested an opportunity to estimate the effect of the draft on the different classes. As shown in the table, 5,053, or 85.5 per cent. of the students who have already replied, are subject to the draft, and of these 29 per cent. are included in the first call; 19.4 per cent. in the second call and 51.6 per cent. in later calls; 12.4 per cent. are exempt on account of age, 0.5 per cent. are aliens, and 1.6 per cent. have already enlisted. As will be noticed, 729 are exempt on account of age; of these 606 are under age, and 123 over the age limit. Unless some arrangement is made, therefore, whereby these students are enabled to complete their medical training, classes in medical schools will be seriously depleted; the supply of physicians for the future will be seriously reduced, and this country will suffer from an error similar to that made in England and France where medical students were sent to the front. Furthermore, failure to exempt medical students from the draft will be a serious injustice to many, since a few months ago the Council of National Defense, with the apparent agreement of the War Department, urged medical students not to enlist in the Officers' Reserve Corps but to remain in college and complete their medical training. Had not that request been made, many students would have voluntarily enrolled in officers' training corps, where many of them would doubtless have been successful. Even though less than a third of the medical students of draft age will be included in the first call, a much larger proportion will be lost to the medical schools,

since, in the absence of a definite understanding, many of the others will enlist voluntarily in the ranks, in ambulance corps or in officers' training corps. A definite decision on the part of the War Department relative to medical students is imperative. Unless such decision is made, not only will our civil hospitals lack adequate intern service, but the government will lose by the fact that those capable of skilled service will have been defleeted to work which can be as well done by others.

CAMOUFLAGE

Camouflage, as most of our intelligent readers know, is not the name of a Swiss cheese, but of a military measure. It is reminiscent of the little jingle:

Little dabs of powder
Little specks of paint
Make the girls' complexions
Look like what they ain't.

Camouflage has been extensively used in France to make spies and investigators believe that a hidden battery possessed of the power of completely annihilating several regiments of hostile troops is merely an inoffensive arboreal retreat or a part of the surrounding landscape. Used with reverse English it causes an old keg to resemble a trench mortar capable of hurling tons of steel. But camouflage is not wholly confined to the war zone. The word fits so aptly many aspects of our daily life that it will soon be a part of our daily conversation. F'rinstance, when a newspaper says that the death rate among the doctors is higher than that of any other part of the service, some camoufler has been camouffling. When it is announced that the army needs 34,000 additional doctors, that's camouflage. But it's psychic not physical camouflage. Even so it may mislead.

"THE DOCTOR'S DILEMMA"

Among the many interesting developments in connection with the mobilization of the new National Army, there is one which has a particular interest to physicians. It is best illustrated by an example: A Canadian by birth, well educated and doing good work in medicine, who had recently taken out his first papers, made application for admission to the Medical Reserve Corps. Because he was not a fully naturalized citizen, he was informed that he was not qualified for this corps. Now he writes that he is within conscription age, was drawn on the first call, and has been ordered to report for examination. If he is physically fit, he will be told to await orders as to when he shall report to the cantonment camp. "What will become of me?" he asks. "Am I to go into the line as an ordinary soldier? It certainly looks that way." From the communications we are receiving, a large number of physicians are in the same predicament. We regret that we cannot answer the questions; the problem probably will be solved by the proper authorities in due course. But the condition is a peculiar one. According to one law, an alien physician who has taken out only his first citizenship papers is not eligible for the Medical Reserve Corps; another law makes him subject to conscription. The problem applies to other than the medical section of the Officers' Reserve Corps — to the quartermasters', engineers', ordnance, signal, judge-advocate and other sections of the Officers' Reserve Corps. This conflict between laws relating to practically the same proceeding undoubtedly will be overcome either by regulation or by new legislation.

THE EXPERIMENTAL PRODUCTION OF CANCER

A few weeks ago The Journal commented on the fact that Yamigawa and Ichikawa[1] had been able to produce cancer at will on the rabbit ear by protracted irritation with applications of tar. Recently these investigators have reported further experiments with this method.[2] In the newer experiments, a cancerous degeneration became evident by the one hundred and third day as the shortest interval and by the five hundred and sixty-fifth day as the longest interval in the successful cases. In three instances, metastasis was found in regional lymph glands. Tumor thrombosis in the small veins was detected in many cases, but metastasis in internal organs by way of the blood stream has not yet been encountered. These experiments confirm the previous statement that protracted stimulation alone, without an inherited tendency or any specific agent, is able to induce cancer with typical cancer metastasis. They demonstrate further that on cessation of the irritation the carcinoma may retrogress and be crowded out by proliferation of connective tissue. In these cases the cancer cells do not return to normal, but are prevented from further growth by the pressure of the proliferating connective tissue, which finally replaces them completely.

THE ROLL OF HONOR

In a few weeks we hope to publish the data regarding what the profession of each state and of each county of each state has done toward providing physicians for the Army. At that time the names of those who have accepted commissions in each county will be given, together with the number of physicians in the county and the population. Thus it may be known what states and what communities have supplied their quota of physicians.

NOT YET TIME TO RELAX

We can be proud of the fact that there is an ample supply of physicians for the immediate needs of our Army, but we must not cease recruiting. An analysis of the needs of our Army made on June 1 indicated that 20,000 medical officers would be required to complete the program for the raising of the Army outlined by Congress and the President, that is, the regular Army, the National Guard and the full National Army. This is a liberal allowance since the maximum

1. The Experimental Production of Cancer, Editorial, The Journal A. M. A., June 16, 1917, p. 1818.
2. Yamigawa and Ichikawa: Japan. Ztschr. f. Krebsforsch., 1917, 11, 19.

Army in the field as at present defined by law is 1,700,000 men. Adopting the minimum estimate that there are now 13,000 medical officers commissioned in the reserve corps, we should continue our efforts not only until the full 20,000 physicians are provided but also a surplus. It is well to have a big reserve.

Medical Mobilization and the War

Red Cross Commission to Italy

The Red Cross War Council has announced the appointment of a special Red Cross War Commission to Italy which will advise how American Red Cross activity can best be exerted to meet the needs of the soldiers and civil population of that country. This is the fourth Red Cross Commission to go to Europe, the others having gone to France, to Russia and to Roumania. The Commission to Italy is headed by George F. Baker, Jr., vice president of the First National Bank of New York City. With him go John R. Morron, president of the Atlas Portland Cement Company; Dr. Thomas W. Huntington, San Francisco, president of the American Surgical Association; Dr. Victor G. Heiser of the United States Public Health Service, and Nicholas F. Brady of the Central Trust Company, New York. Professor Chandler R. Post of Harvard University, an authority on Italy, has been detailed to assist the commission.

Physicians Recommended for Commission in the Medical Reserve Corps

During the week ending July 28, 577 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 13 majors, 96 captains and 468 lieutenants.

During the week ending August 4, 714 physicians were recommended for commission in the Medical Reserve Corps, the proportion being 4 majors, 78 captains, 632 lieutenants.

The Cantonment Hospitals

At each of the cantonments for the new national army hospital provision will be made for 3 per cent. of the troops. At each cantonment a complete hospital containing at least 1,000 beds will be constructed, with a space reserved for extensions. Sixty acres have been allotted to each hospital and its auxiliary buildings. The hospitals will cost approximately $500,000 each. One type is being used in all the hospital construction work done by the army. The buildings are 24 feet wide, the length varying to meet the special needs. The wards are usually 157 feet long, which is the size needed for 32 beds. There will be a diet kitchen for each ward, a porch at one side and end of each ward, and a corridor connecting with the buildings on either side which will be covered in the case of the northern cantonments. About seventy buildings will be comprised in each cantonment hospital. Each hospital will have a well equipped laboratory for bacteriologic and pathologic work. There will also be an infirmary for each regiment.

Hospital Provisions for the Army

The provisions for caring for the health of the soldiers now being made by the Medical Department of the Army include the construction of thirty-two hospitals at National Guard and National Army camps, the enlargement of some thirty hospitals used in connection with officers' training camps, the taking over or the construction of at least two general hospitals at ports, increasing the size of two general hospitals behind these and the building or taking over of general hospitals to be used for special treatment work. A further step will be the establishment of so-called "reconstruction hospitals." In these artificial limbs will be made, repair surgery done, artificial limbs fitted to patients and the reeducation of cripples begun. It is aimed to have hospital provisions for 5 per cent. of the enlisted force by October 1, and then to proceed to extend that to 10 per cent. Facilities for 20 per cent. of the American expeditionary forces are to be provided abroad.

Baggage for Reserve Officers Ordered to Duty

Inquiries have been received as to whether an officer of the Medical Reserve Corps ordered to active duty should take with him his own instruments and books. This depends largely on the type of service to which the physician is ordered. An officer reporting for field service should take with him the prescribed field equipment and nothing more. Under present circumstances, most reserve officers will be ordered to one of the following duties: to training camps for medical officers, to the cantonments for the National Army and National Guard, or for service abroad. On any of these services the officer should take with him only such books as he feels certain will be of great utility to him, that is to say, books on military subjects. Instruments and medical supplies are furnished. A good rule is to take along only as much personal baggage as can be accommodated in the regular army trunk or locker.

Medical Reserve Corps Men on Active Duty

At the present time there are a little over 3,000 men at the various training camps. In addition, a number who have been at these training camps have been assigned to other active duties, for instance, to base hospitals and other duties in France, to foreign service in our dependencies, to army posts in this country, to special recruiting work, and to mobilization of the National Guard. We understand that 1,000 more men are to be assigned to various training camps for training by August 15. It is quite evident that when the National Army is mobilized the medical corps for that Army will be ample in number and equipped for its work.

Schools of Instruction in Military Roentgenology

At the direction of Surgeon-General Gorgas a conference of Military Roentgenologists was held at Cornell Medical College, New York City, June 11-25, 1917. The Surgeon-General ordered this conference with a view toward standardizing Roentgen-ray apparatus and arranging courses of study in military roentgenology.

Major Arthur C. Christie from the Surgeon-General's office and Major P. W. Huntington from the Army Medical School represented the Army. The instructors, who will have charge of the several schools in various parts of the country, were present with members of the Committee on Preparedness of the American Roentgen Ray Society.

Schools of instruction have been established in Boston, Major A. W. George, M. R. C.; New York City, Majors L. G. Cole and L. T. LeWald, M. R. C.; Philadelphia, Major W. F. Manges, M. R. C.; Baltimore, Major F. H. Baetjer, M. R. C.; Richmond, Major A. L. Gray, M. R. C.; Pittsburgh, Major G. C. Johnston; Chicago, Capt. E. S. Blaine, M. R. C.; Kansas City, Capt. E. H. Skinner, M. R. C., and Los Angeles, Capt. W. B. Bowman, M. R. C.

The government has established these schools for the purpose of giving instruction in Roentgen-ray work to selected officers in the Medical Reserve Corps. They will be ordered to active duty on pay according to rank for the period of instruction. The length of the course will be about three months, but officers who have had considerable experience in Roentgen-ray work or those who become proficient before this time will be certified to the Surgeon-General as soon as they become qualified. Those who show lack of adaptation or application will be relieved of this detail and assigned to other duties or discharged by order of the Surgeon-General.

Physicians desiring to take this work will proceed as follows: (1) Write a letter to the nearest school immediately indicating your preference for this Roentgen-ray course, stating your experience in the work. (2) Make application for a commission in the Medical Reserve Corps, through the nearest medical recruiting officer. (3) Write a letter to the Surgeon-General, attention Major Christie, asking to be placed on this Roentgen-ray instruction detail at the nearest school and attach this letter to the papers which are sent in at the time you take your examination for the commission. (4) When you have received your commission, accept it and write a letter to the nearest school, stating that you have received and accepted your commission and are ready for active duty.

The government is going to the expense of training these selected officers as military roentgenologists and will, therefore, be desirous of using them in this capacity in the field, base hospital or other detail, to the greatest extent possible.

Enlistment in Red Cross Ambulance Service Not to Exempt From Draft

The Provost-Marshal General has ruled that service in Red Cross ambulance companies is not military service within the meaning of the law and is not a valid claim for exemption or discharge.

Sanitation Around the New Cantonments

The American Red Cross has appropriated $800,000 to aid in controlling sanitary conditions in the civilian areas surrounding army cantonments. This work will be done under the instruction of a newly created Bureau of Sanitary Service headed by Dr. W. H. Frost of the Public Health Service.

To Increase Pennsylvania Base Hospital

Additional nurses and enlisted men are needed for the base hospital unit of the Pennsylvania Hospital, now in France. This unit, at the request of the British government, was sent to France to take over a British base hospital of 2,000 beds. The unit was raised to care for a hospital of 500 beds, so has been doing increased work, and Major Harte has sent a request to the Surgeon-General that the Pennsylvania Hospital send more men and nurses. The following physicians have been selected to go with the unit: Drs. J. Paul Austin, Germantown; Richard C. Beebe, Lewes, Del.; William L. Cunningham, Philadelphia; Michael M. Nolan, Birmingham, Ala.; George W. Outerbridge, Philadelphia; I. B. Roberts, Llanerch; William Whitaker and H. B. Wilmer, Germantown; Hersey E. Orndoff, St. Louis.

Virginia Base Hospital Organized

Base Hospital Unit No. 41 is being organized at the University of Virginia, University, Va. Dr. William H. Goodwin, associate professor of surgery, is to be the director. Fifty of the sixty-five nurses required have enrolled, and about all of the enlisted personnel have been secured. The members of the staff, thus far, are as follows: Dr. Lomas Gwathmey, Norfolk; Dr. Minor Carson Lile, New York City; Dr. Kyle B. Steele, Richfield Springs, N. Y.; Dr. Leroy W. Hyde, University; Dr. Joseph S. Hume, Norfolk; Dr. John W. Burke, Washington, D. C.; Dr. Robert E. Pound, New York City; Dr. Gordon L. Todd, Princeton, W. Va.; Dr. Herbert F. Jackson, New York City; Dr. Hugh P. Nelson, Charlottesville; Dr. Dan H. Witt, New York City; Dr. Edward C. Ashby, Greensboro, N. C.; Dr. John D. Barnwell, New York City; Dr. Claude C. Caylor, Washington, D. C.; Dr. Lucius G. Gage, University; Dr. George C. Parry (dentist), Philadelphia; Dr. Edward B. Broocks, Charlottesville; Dr. Walter E. Miller, Norfolk, and Dr. George Y. Gillispie, Bryn Mawr, Pa.

University of Pennsylvania Hospital Unit Completed

Maj. John B. Carnett, Philadelphia, medical director of Base Hospital Unit No. 20, announced that his personnel is completed and his equipment ready. Major Eldridge L. Eliason is chief of the surgical section and Major George M. Piersol, chief of the medical section. The other members of the staff are as follows: Captains Damon B. Pfeiffer, surgeon; De Forest P. Willard, orthopedic surgeon; B. Franklin Baer, Jr., ophthalmologist; Floyd E. Keene, surgeon; James H. Austin, physician; John H. Musser, Jr., physician; Jay D. Zulick, chief of Roentgen ray and laboratory section; Fred H. Leavitt, neurologist; F. Thomson Edwards, registrar.

The following on the staff are first lieutenants: Seth A. Brumm, laryngologist; Alexander Randall, genito-urinary surgeon; Edmund B. Piper, surgeon; William Bates, surgeon; Benjamin M. McIntire, physician; Richard D. Hopkinson, physician, Jenkintown; R. N. Goldsmith, physician, Scranton; Edward L. Clemens, physician; Philip F. Williams, pathologist; Alfred C. Woods, bacteriologist; J. D. Owens, dental surgeon, Camden; F. P. K. Barker, dental surgeon.

First Impressions of a Base Hospital

Major Frederick A. Besley, M. R. C., director of Base Hospital No. 12, U. S. Army, now in France, writes: We have now been at this hospital a month and I am taking this opportunity to write some of my early impressions. The hospital is made up partly of huts and partly of tents and acts as a general hospital occupying the place between the casualty clearing station, where most of the urgent and early operations are done, and the permanent base hospitals in England. In a word, it is a kind of segregating station. The patients whose conditions are serious are cared for as well as possible and then sent on to England. The minor cases are kept here until they recover and they are then sent to large convalescent camps or to their base details.

The British personnel has gradually left us until this morning our good Commanding British Officer, Colonel ———, took his departure and Major Collins is in complete control of the unit. Unfortunately, our force of nurses and the number of enlisted men is quite inadequate to cope with so large a hospital. We had expected to find a hospital of 850 beds and much to our surprise it is capable of caring for 2,000 patients, and our average number is from 1,200 to 1,300. During the last week we received a convoy practically every day of from 150 to 200 new patients. Evacuations are taking place every day. Each individual case requires the exercise of medical or surgical judgment, so the task is not a small one.

We are one of five similar hospitals in this immediate vicinity, and there are six or seven other hospitals about four miles from us. Dr. Cabot's Harvard unit, under British control, adjoins us; and adjoining him, about one-fourth of a mile away, is Major Patterson of the regular army with Major Harvey Cushing and the new Harvard unit under American control.

We cannot commend or praise the attitude of the English medical officers too much. They have all been most courteous and friendly in all their relations. We were met before we left the ship and have been shown every attention since that time. Major Collins and I are receiving the most loyal and willing support from every member of the unit, and up to date we have not encountered the slightest friction. The citizens of Chicago should be proud of the spirit which is being shown by these fine boys who make up our enlisted force. They work at the most arduous menial and oftentimes disagreeable tasks with a cheerfulness which is little short of wonderful.

Psychiatrists and Neurologists Instructed on Examination of Troops

The Committee on Clinical Methods and Standardization of Examination and Reports, a subcommittee of the Mental Hygiene War Work Committee of the National Committee on Mental Hygiene, has submitted, at the request of the Surgeon-General, an outline to be followed in determining which men should be excluded from military service on account of mental and nervous diseases. This committee is composed of the following physicians: August Hoch, Ward's Island, New York; Adolf Meyer, Johns Hopkins University, Baltimore; Thomas W. Salmon, New York; Pearce Bailey, New York; E. E. Southard, Boston; Albert M. Barrett, Ann Arbor, Mich.; William A. White, Washington, D. C.; Walter E. Fernald, Waverly, Mass.; Joseph Collins, New York; T. H. Weisenburg, Philadelphia, and Robert M. Yerkes, Cambridge, Mass.

Because of its practical character, this outline is given herewith in full:

I. NERVOUS DISEASES

(*a*) On the Basis of Disease

1. Tabes. (Look for Argyll Robertson pupils, absent knee and ankle jerks, ataxia of station and gait.)
2. Multiple sclerosis. (Look for absent abdominal reflexes, nystagmus, intention tremor.)
3. Progressive muscular atrophy and syringomyelia. (Look for fibrillary tremors; atrophy in the small muscles of the hand and of the muscles of the shoulder girdle; scars on forearm and fingers caused by burning; deformities of feet.)
4. Epilepsy. (Look for deep scars on tongue, face and head; voice. Where diagnosis depends only upon history of epileptic attacks given by the patient, the latter should be asked to give the address of the physician who has treated him. This history must then be verified by a letter from the physician.)
5. Hyperthyroidism. (Look for persistent tachycardia, exophthalmos, tremor, enlarged thyroid.)

(*b*) On the Basis of Symptoms or Combination of Symptoms or History

1. Unequal pupils; irregular pupils; Argyll Robertson pupils.
2. Nystagmus (in one not an albino); absent abdominal reflexes; intention tremor.
3. Absent knee jerks associated with some one other organic neurologic symptom.
4. Exaggerated tendon jerks; Babinski.
5. Disorders of station or gait.
6. Disorders of speech (on test phrases); facial tremor; one other organic neurologic symptom. (Stammering and stuttering per se is not significant of an organic neurologic condition. Stammerers and stutterers are rejected by regulations. See form No. 94777.)

7. History of epilepsy. (Ask the recruit to give the address of the physician who has attended him; this information to be verified by letter.)

II. MENTAL DISEASES

(*a*) On the Basis of Disease

1. General paralysis. (Look for Argyll Robertson pupils, speech defect consisting of distortion of words, writing defect consisting of distortion of words, facial tremor in showing the teeth, euphoria and marked discrepancies in giving facts of life.)
2. Dementia praecox. (Look for indifference, ideas of reference, feelings of the mind being tampered with [e. g. ideas of hypnotism], auditory hallucinations, bodily hallucinations such as electrical sensations or sexual sensations, meaningless smiles; in general, inappropriate emotional reactions, lack of connectedness in conversation.)
3. Manic depressive insanity. (Look for mild depressions with or without feeling of inadequacy or mild manic states with exhilaration, talkativeness and overactivity.)

(*b*) On the Basis of Symptoms or Combinations of Symptoms or History

1. History of previous mental illness (Ask the recruit to state when and where he had such illness, in what hospital he was observed or treated or by what physician he was attended; this information to be verified by letter.)

III. PSYCHONEUROSES AND PSYCHOPATHIC CHARACTERS

Look for phobias, morbid doubts and fears, anxiety attacks, fatigueability, hypochondriasis, compulsions, homosexuality, grotesque lying, vagabondage.

IV. CHRONIC ALCOHOLISM

Look for suffused eyes, prominent superficial blood vessels of the nose and cheek, flabby, bloated, reddened face, purplish discoloration of the mucous membrane of the pharynx and of the soft palate; also ashen complexion and clammy skin, muscular tremor in the protruded tongue and extended fingers (noticeable also in lack of control when the applicant attempts to sign his name), emotionalism, prevarication, suspicion, auditory or visual hallucinations, paranoid ideas.

V. MENTAL DEFICIENCY

Look for defect in general information with reference to native environment, ability to learn, to reason, to calculate, to plan, to construct, to compare, weights, sizes, etc.; defect in judgment, foresight, language, output of effort, suggestibility, stigmata of degeneration, muscular incoordination (consult psychometric findings).

VI. DRUG ADDICTION

Look for pallor, dryness of skin; flippancy, mild exhilaration (if under the influence); cowardly, cringing attitude; restlessness, anxiety (if without the drug), distortion of the alae nasi, contracted pupils (morphin) or dilated pupils (cocain), dirty deposit at junction of gums and teeth, bluish and whitish needle scars on thighs and arms.

Orders to Officers of the Medical Corps

Major Clarence Le R. Cole, M. C., to Fort Sam Houston, Texas, for duty in charge of the department laboratory, S. D.

Capt. James E. Baylis, M. C., from command of Ambulance Co. No. 5, Camp Funston, Leon Springs, Texas, and assigned to command Field Hospital No. 5, same station, vice Capt. George W. Cook, M. C., relieved.

First Lieut. Charles M. O'Connor, Jr., M. C., to Honolulu for duty.

Capt. Glenn I. Jones, M. C., is designated as cantonment surgeon at the N. A. Cantonment, Camp Devens, Ayer, Mass.

Lieut.-Col. Jere Black Clayton, M. C., to Washington for examination for promotion.

Capt. R. Reynolds, M. C., to Pittsburgh, Pa., for duty in command of Base Hospital No. 27.

Capt. A. P. Clark, M. C., assigned to Fourth Reserve Engineers permanently.

Capt. H. H. Sharpe, M. C., from Fort Davis, Alaska, to Chicago.

Orders to Officers of Medical Reserve Corps

ALABAMA

To FORT SAM HOUSTON, TEXAS, to report to commanding general Southern Dept., for duty, Lieut. R. C. Speir, Furman.

CALIFORNIA

To CHICAGO for duty, Capt. Sidney E. D. Pinniger, Tracy.

To FORT DES MOINES, IOWA, for duty, Lieuts. L. Stovall and W. A. Tarleton, Los Angeles.

To TECATE, CALIF., for duty, Lieut. Samuel C. Leonhardt, Oakville.

To report in person to commanding general, Western Dept., for duty, Capt. Alex. Patterson and Lieut. C. E. Mordoff, San Francisco.

Honorably discharged, Capt. John M. Armstrong, Alhambra.

CONNECTICUT

To CAMP KELLY, SOUTH SAN ANTONIO, for duty, Lieut. Michael J. Sheahan, Derby.

DISTRICT OF COLUMBIA

To WALTER REED GENERAL HOSPITAL, TAKOMA PARK, D. C., for duty, Lieut. Earle G. Breeding, Washington.

To report in person to Surgeon General of Army for duty in office of the attending surgeon, Capt. H. P. Parker, Washington, D. C.

FLORIDA

To CHICKAMAUGA PARK, GA., for duty, Lieut. Julian E. Gammon, Jacksonville.

GEORGIA

To SOUTH SAN ANTONIO, to accompany two aero squadrons to Mount Clemens, Mich., Lieut. Elmer E. Mansfield, Pavo.

ILLINOIS

To BELLEVILLE, IND., as post surgeon, Lieut. Harry L. Logan, Salem.

To duty in connection with examination for tuberculosis of National Guard at their armories in Chicago, Lieut. S. M. Marcus, Chicago.

Resignation of Lieut. J. E. Marshall, Chicago, accepted.

INDIANA

Honorably discharged, Capt. Blanchard B. Pettijohn, Indianapolis.

KENTUCKY

To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Dept., for duty, Lieut. E. A. Campbell, Carlisle.

To PADUCAH, KY., for duty in connection with examination of applicants for appointment in the Medical Reserve Corps of the Army, Lieut. Frederick D. Cartwright, Bowling Green.

LOUISIANA

To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Dept., for duty, Lieut. O. J. Gee, Shreveport.

MAINE

To BOSTON in connection with the examination for tuberculosis of National Guard at armories, Capt. Nelson E. Nichols, Hebron.

To EL PASO, TEXAS, to make psychiatric and neurologic examinations, Capt. Henry M. Swift, Portland.

MARYLAND

To ANNAPOLIS JUNCTION, MD., as sanitary officer of cantonment of N. A. Lieut. Frank N. Hoffmeier, Hagerstown.

To FORT OGLETHORPE, Lieut. W. R. McKenzie, Baltimore.

From further active duty, Lieut. Montrose T. Burrows, Baltimore.

MASSACHUSETTS

To BOSTON for duty, Lieut. Harry F. Cahill, Worcester.

To FORT LEAVENWORTH, Disciplinary Barracks, Lieut. R. M. Chambers, Westboro.

To FORT LOGAN H. ROOTS, ARK., Major Fred B. Lund, Boston.

To his home, Capt. Harvey A. Kelly, Winthrop.

MICHIGAN

To DETROIT and assume command of Base Hospital No. 36 and enlist and muster in additional personnel, Major Burt R. Shurley, Detroit.

MINNESOTA

To FORT LEAVENWORTH for duty, Lieut. F. P. Frisch, Kimball Prairie.

MISSOURI

To FORT DES MOINES, IOWA, Lieut. Fenton N. Goodson, St. Joseph.

To FORT SAM HOUSTON, Lieut. G. L. Kerley, Kansas City.

NEBRASKA

To FORT OGLETHORPE, Capt. Frank M. Conlin, Omaha.

NEVADA

To FORT DOUGLAS for duty, Capt. E. D. Giroux, Winnemucca.

NEW JERSEY

To FORT LEAVENWORTH, Lieut. F. H. Thorne, Greystone Park.

To FORT OGLETHORPE, Lieut. Floyd C. Shugart, Orange.

NEW YORK

To FORT TERRY, N. Y., for duty with Provisional C. A., Lieut. Edgar W. Beckwith, Bronxville.

To GETTYSBURG NATIONAL PARK, PA., for making psychiatric and neurologic examinations, Lieut. Sanger Brown, White Plains.

To NEW YORK for duty, Capt. Bernard S. Oppenheimer, New York.

To CORNELL MEDICAL COLLEGE, Lieut. Samuel Brown, New York.

To ROCKEFELLER INSTITUTE of Medical Research, New York, Capt. Francis R. Lyman, Hastings upon Hudson; Lieuts. C. G. Burdick, H. E. Meleney and A. M. Wright, New York.

To duty in connection with examination for tuberculosis of National Guard at their armories in New York and Brooklyn, Capt. W. J. Hammer, New York.

To report in person to commanding general, Eastern Department, for duty, Lieut. David Bovaird, New York.

To report in person to commanding general, Eastern Department, for duty in Transport Service, Lieut. E. J. Davin, New York.

To SYRACUSE, N. Y., for duty, Capt. G. B. Campbell, Utica.

Honorably discharged, Capt. J. B. Gere, New York.

NORTH CAROLINA

To FORT OGLETHORPE, Capt. Charles S. Lawrence, Winston Salem; Lieuts. W. E. Brackett, Caroleen, and John T. Benbow, East Bend.

OHIO

To FAIRFIELD, OHIO, Flying School, Aviation Section, for duty as post surgeon, Capt. Courtney P. Grover, National Military Home.

To FORT SAM HOUSTON, Major Frank E. Bunts, Cleveland.

OKLAHOMA

To FORT RILEY, Lieut. Ross D. Long, Oklahoma City.

To FORT SAM HOUSTON, Lieut. S. R. Evans, Stilwell. To report to commanding general, Southern Dept., for duty, Capt. R. L. Kurtz, Nowata; Lieuts. J. E. Parramore, Antlera; B. T. Bittings, L. L. Bunker, Enid; W. W. Rucks, Guthrie; H. DeW. Shankle, Hastings; C. M. Ming, Okmulgee; S. D. Bevill, Poteau, and F. C. Myers, Broken Arrow.

PENNSYLVANIA

To ALLENTOWN, PA., for duty, Lieut. C. J. Cavanagh, Philadelphia.

To ARMY MEDICAL SCHOOL, Washington, D. C., as professor of ophthalmology, Major William T. Davis, Dunmore.

To FORT LEAVENWORTH, Lieut. G. R. Moffitt, Harrisburg.
To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Department, for duty, Lieuts. W. C. Browne, Burnside, and F. L. Patterson, Imperial.
To DES MOINES, IOWA, for duty, Lieut. L. L. Rodgers, Kingston.
To MONMOUTH PARK, N. J., for duty, Major W. P. Barndollar, Pittsburgh.
To PHILADELPHIA, Lieut. James W. Levering, Philadelphia.
Honorably discharged, Major Melvin M. Franklin, Philadelphia.
Retired, Lieut. Thomas W. Moran, Latrobe.

TENNESSEE

To ALLENTOWN, PA., Capt. W. A. Brewer, Memphis.
To DES MOINES, IOWA, for duty, Lieut. J. L. Leach, Nashville.

TEXAS

To FORT DOUGLAS, for duty, Lieut. C. T. Smith, Canton.
To FORT SAM HOUSTON, TEXAS, to report to commanding general, Southern Department, for duty, Capts. C. M. Hendricks, El Paso; T. L. Kennedy, J. S. Jones, Galveston; J. T. Moore, Houston; M. Duggan, F. L. Paschal, San Antonio; Lieuts. C. H. Brownlee, Burnet; G. S. Woods, Devine; F. A. Haggard, Fort Worth; E. R. Townsend, Fredericksburg; E. A. Frechet, Frisco; M. D. Levy, H. L. McNeil, Galveston; J. J. Handley, Greenville; R. M. Fancher, J. C. Michael, M. V. Moth, J. F. Gamble, Houston; R. K. Lowry, Hubbard; R. A. Gordon, Lorena; J. F. McDonald, Meridian; T. R. Burnett, Mission; L. S. Johnson, Richmond; W. C. Hirzel, C. B. Kitowski, W. H. Cade, San Antonio; Arthur W. Bergfeld, Seguin; W. H. Lyon, Tracy; L. D. Parnell, Waxahachie; L. Frazier, Westville; R. H. Coleman, Whitesboro; and G. Graham, Oak Forest.

UTAH

To FORT DOUGLAS, Lieuts. Arthur A. Bird, Magna, and Lorin F. Pich, Ogden.

WASHINGTON

To SEATTLE, WASH., to conduct the preliminary examinations of applicants for appointment in the Medical Corps of the Army, Capt. Ira C. Brown, Seattle.

WEST VIRGINIA

To DES MOINES, IOWA, for duty, Lieut. C. H. Laws, Elkin.
To ROCKEFELLER INSTITUTE, New York, for duty, Lieut. John C. McCoy, Queens.

WISCONSIN

To FORT SAM HOUSTON, to duty with two aero squadrons and to accompany these troops to Fairfield, Ohio, Lieut. Will G. Merrill, Grand Rapids.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Physicians Win Suit.—Drs. N. J. Brown and N. N. Brown, Bakersfield, have been awarded $5,000 in the suit which they brought against the estate of the late E. J. Boust for professional services rendered the deceased for one year, when he was injured in an automobile accident.

Municipal Appointments.—Dr. Shelby P. Strange, surgeon of the San Francisco Emergency Service, and Dr. J. Montague Rose, resident physician of the San Francisco Tuberculosis Hospital, have resigned.——Dr. Solomon Bauch has been appointed resident physician of the municipal tuberculosis hospital, succeeding Dr. Rose.

Personal.—Major Philip S. Chancellor, M. R. C., U. S. Army, Santa Barbara, has requested that he be demoted to captain, in order that he may go to France with the San Francisco City and County Hospital Unit.——Dr. Saton Pope, San Francisco, has succeeded Dr. Alanson Weeks as chief surgeon of the San Francisco Emergency Hospital.——Dr. D. W. Zirker, Merced, has resigned as county physician of Merced to accept a position in the Medical Reserve Corps.

FLORIDA

Eclectic Examiners Appointed.—Governor Catts has appointed the following board of eclectic medical examiners: Dr. George A. Munch, Tampa; Dr. John A. McDonald, Century, and Dr. Jerome D. Stuart, Miami.

New State Board Officers.—The recently appointed state board of health met at Tallahasse and organized by electing Mr. Charles T. Frecker, president. Dr. William H. Cox, Brooksville, was elected state health officer, succeeding Dr. Joseph E. Taylor, Live Oak; Dr. Hiram Byrd, Princeton, was appointed scientific inspector; Dr. William R. Warren was appointed to succeed Dr. Joseph Y. Porter at Key West, and Dr. F. Lothair Tatum, De Funiak Springs, was appointed to succeed Dr. Clinton W. D'Alemberte, Pensacola, as custodian and supervisor of the state bacteriologic laboratories and Isolation Hospital, Pensacola, and to be in charge of all matters pertaining to the public health in western Florida.

Personal.—Lieut.-Col. Joseph Y. Porter, Jacksonville (retired), has been placed on the active list, and assigned to duty in the office of department surgeon, Southeastern Department, Charleston, S. C. The Rotary Club of Key West, at its meeting, June 20, adopted resolutions laudatory to Colonel Porter.——Dr. Edward G. Birge has resigned as director of the state bacteriologic laboratory at Jacksonville, and has been succeeded by Dr. Burdett L. Arms, Montgomery, chief bacteriologist of the Alabama State Board of Health.——Dr. Iva C. Youmans, Melrose, has resigned as bacteriologist in the state laboratory at Miami, and will enter private practice at Jacksonville. She has been succeeded by Dr. Harold H. Fox, Tallahassee.——Dr. Herbert R. Mills, Tampa, bacteriologist in charge of the state board of health laboratory, has resigned, and has been succeeded by Dr. Claude P. Fryer, New Orleans.

ILLINOIS

Examining Board Appointed.—A board to exercise the examining functions under the administrative code, formerly performed by the state board, has been appointed as follows: For medical practitioners, Dr. L. C. Taylor, Springfield; Dr. Carl E. Black, Jacksonville, and Drs. John H. Robinson, G. M. Cushing and William L. Noble, Chicago.

Menard County Wins Red Cross Flag.—Menard County, of which Petersburg is the county seat, has been announced as the winner of the Red Cross flag, made by the wife of the governor, to be awarded to the county obtaining the greatest proportional membership for the American Red Cross. Menard County, with a population of 12,796, has enrolled 3,780 as members.

Personal.—Dr. Charles F. Read, formerly superintendent of the Watertown State Hospital, has been appointed superintendent of the Chicago State Hospital, Dunning, to succeed Dr. George Leininger.——Dr. Edward S. Godfrey, Jr., has resigned as director of the bureau of communicable diseases of the state board of health, to accept a position in the sanitary department of the New York State Department of Health. He has been assigned to the district comprising Albany and Rensselaer counties.

Chicago

Personal.—Dr. Arthur Lederer, formerly of the Sanitary District of Chicago, has been appointed director of the State Hygienic Laboratory of West Virginia, Morgantown.——Dr. Walter H. Watterson, Oak Forest, has been appointed medical superintendent of the Municipal Tuberculosis Sanatorium.——Dr. D. S. Hager has completed the annual reexamination for sight, color-sense and heart of the trainmen of the Santa Fe System, on the eastern and western lines.

MARYLAND

Fort McHenry for Base Hospital.—The federal government has reclaimed Fort McHenry, which was loaned three years ago to Baltimore for a park, and will use it as a base hospital for the army. The old fort buildings will be renovated and made available for this purpose, and the new immigration station buildings now nearing completion will also be used in the plans for the establishment of a large base hospital in Baltimore. The new buildings cost $500,000, and include a modern equipped hospital building for the treatment of sick immigrants landing at the port of Baltimore. This now, however, will be used solely for the army.

Personal.—Dr. Alexander D. McConachie, Baltimore, has been operated on for appendicitis at the Church Home and Infirmary. His condition is reported as favorable.——Dr. William Kelso White, Baltimore, who is connected with the Maryland University Hospital Unit, has been commissioned captain in the Medical Officers Reserve Corps.——Dr. C. Frank Jones, one of the health wardens of Baltimore, has been named by Commissioner of Health John D. Blake as acting head of the division of communicable diseases with the rank and pay of an assistant commissioner. Dr. Jones takes the place of Dr. John F. Hogan, who temporarily becomes first assistant to Dr. Blake.—Dr. Henry C. Houck has been appointed a substitute health warden for Baltimore.

MICHIGAN

Sanatorium Proceedings.—The Detroit Board of Health, July 23, voted to erect a municipal tuberculosis sanatorium with 605 beds, at an approximate cost of $975,000.——At a conference, held in Powers, July 19, the county supervisors discussed the question of a joint tuberculosis sanatorium for Delta, Dickinson and Menominee counties.

Personal.—Dr. Hugo A. Freund, recently appointed health commissioner of Detroit, was elected president of the board of health, July 23, succeeding Lieut.-Col. Angus McLean, called to the front to be director of the Harper Base Hospital Unit No. 17, and Dr. Francis Duffield, a newly appointed health commissioner, was appointed vice president, to take the place of Major J. Walter Vaughan, who has also been called to the colors.——Dr. Forrest R. Ostrander, Detroit, has been appointed full-time health officer of Lansing, and will take up his duties, August 15, when the resignation of Dr. Lynch becomes effective.——Dr. Charles B. G. de Nancrede, professor of surgery in the University of Michigan, has resigned.

NEW YORK

State Food Bill Framed.—A bill after the best features of the national and the Whitman food control measures has been framed by Elon R. Brown and introduced into the legislature. The governor does not favor giving the proposed State Food Commission of three members power to commandeer food products except those held in storage by food speculators. No attempt will be made to seize the crops of producers.

State Society Meeting.—The medical men of Albany have named the committee on arrangements for the meeting of the Medical Society of the State of New York, to be held in Albany, May 21 to 24, 1918. Dr. Arthur J. Bedell has been appointed chairman of the committee, and will be assisted by Drs. Frederick C. Conway, Thomas W. Jenkins, Howard E. Lomax, Andrew MacFarlane, Leo H. Neuman, James F. Rooney and James N. Vander Veer.——Dr. James F. Rooney, Albany, has been appointed chairman of the committee to revise the workman's compensation law.

Civil Service Positions.—The Civil Service Commission of New York State announces the following positions in the state department of health: diagnostician and epidemiologist, salary $3,500, open to men and women, and limited to physicians; medical expert on tuberculosis, salary $3,200, open to men and women, and limited to physicians; assistant to the deputy commissioner, salary $3,200, open to men and women, and limited to physicians; and bacteriologist, salary $2,000, open to men and women, minimum age, 25 years, preferred ages 30 to 40 years, a degree in medicine or an equivalent education in a college maintaining a standard satisfactory to the commission. Applications must be received before August 29.

Mobilization of County Tuberculosis Hospitals.—With a view to assisting in carrying out all the provisions of the recently enacted law requiring the construction of tuberculosis hospitals in counties of 35,000 population or more, Dr. Hermann M. Biggs, state commissioner of health, has appointed two committees to take charge of the tuberculosis situation in this state. The first committee, headed by John A. Smith, will have general supervision of the sites, plans, construction and equipment of tuberculosis hospitals, and will carry on the antituberculosis campaign in the state. The second committee will act as an advisory board. On the first committee are John O. R. Eichel, E. S. McSweeney and Matthias Nicholl, Jr., deputy commissioner of health, as a member, ex-officio, as well as engineering and construction experts. The advisory committee consists of Drs. Albert H. Garvin, Raybrock; John S. Billings, New York; Charles Stover, Amsterdam; Horace J. Howk, Wilton, N. Y., and Lawrason Brown, Saranac Lake.

New York City

Mabon's Estate.—The estate of the late Dr. William Mabon, superintendent of the Manhattan State Hospital, who died, February 9, has been appraised at $39,335, which, by the terms of his will, is to be distributed in equal shares between his wife and his two daughters.

Auxiliary Medical Corps for Police Surgeons.—A police surgeon auxiliary medical corps has been organized in Greater New York with a membership of 300. It is under the command of Dr. Edward T. Higgins, chief surgeon of the police department. Dr. Walter A. Sherwood, Brooklyn, is chief of the local corps from Brooklyn, and Dr. William T. Scovil, Richmond Hill, chief of the local corps from Queens.

Examination for Chief Medical Examiner.—The Municipal Civil Service Commission announces an examination for the position of chief medical examiner of New York. The position pays $7,500 a year, and is to take the place of the coroners who, in accordance with legislation passed some time ago, will go out of office, Jan. 1, 1918. Physicians more than 30 years of age and having had ten years' experience in a pathologic laboratory have until August 14 to file applications.

Personal.—John F. Harris has become chairman of the New York County Chapter of the American Red Cross, and will serve without pay, as did his predecessor, Harvey D. Gibson.——Dr. Linsly R. Williams, formerly Deputy Commissioner of Health of New York State, has gone to Washington to take an assignment in the office of the Surgeon-General.——Dr. Mortimer M. Raynor, psychiatrist of the department of correction, has been commissioned captain, M. C., U. S. R., and assigned to duty with a staff of psychiatrists.

PENNSYLVANIA

Carlisle Physicians Raise Fees.—High cost of drugs and supplies and increased personal expenses have determined the physicians of Carlisle to raise fees 25 per cent. Six members of the local medical organization are officers in the Medical Reserve Corps.

Governor Approves Appropriations.—State appropriations for a total of $81,223,836.84 for the next two years were approved by Governor Brumbaugh in his final action on appropriation bills, July 27. The $75,000 appropriation for the Medico-Chirurgical Hospital in Philadelphia was disallowed entirely, as the institution has been taken over by the American Red Cross.

State Medical Board Condemns Draft of Medical Students.—August 2 the State Board of Medical Education and Licensure passed resolutions demanding that the federal authorities recall the ruling that medical students and young men about to enter medical colleges be included in the draft. The board contends that such ruling will cut off the future supply of doctors. It is especially emphatic in its denunciation of the view that field service will qualify medical students for the practice of their profession.

National Guard Appointments.—The following appointments in the medical corps have recently been announced: Major John J. Moore, Pottsville, assigned to the First Engineers; Capt. Clifford H. Arnold, Chester, to the Sixth Infantry; Lieuts. Charles I. Trullinger, Harrisburg, Eighth Infantry; Charles L. Reed and Carl J. Cubbison, Wilkinsburg, to Field Hospital No. 4, and Lieuts. Thomas H. Snowwhite, Walter J. Lace and Charles C. Moore to Ambulance Company No. 4.——Major Gregg A. Dillinger has been assigned to duty with the headquarters division.

Philadelphia

National Guard Appointments.—Dr. Arthur J. Logie has been commissioned lieutenant and assigned to duty with Field Hospital No. 3.——Major Fred O. Waage has been placed on the retired list.

Women Physicians Wish to Aid.—A petition containing the signatures of 100 women doctors has been sent to President Wilson, protesting against their exclusion from the war medical forces that are being sent to France.

Ambulances for Jefferson Unit.—August 4, Base Hospital No. 38, organized by the Jefferson Medical College, was presented with four flags by the East Germantown Improvement Association, an ambulance by the Logan Improvement Association, and an ambulance by the Rapid Transit Company.

Personal.—Dr. Harriet L. Hartley has been appointed chief of the division of child hygiene, department of health, succeeding Dr. Henry H. Doan, deceased.——Dr. Gustave A. Van Lennop has been selected by the trustees of the Hahnemann Hospital as director of the new base hospital.——Dr. H. P. Leopold has been chosen as the head of the surgical section and Dr. William Rendell Williams as the head of the medical section.

Warns Army Camp of Smallpox.—Urging that unreported cases of smallpox be searched for at Wrightstown and stamped out in order to prevent an epidemic when mobilization for the new army begins there, Dr. A. A. Cairns, chief medical inspector of the board of health of this city, has written Dr. Jacob C. Price, commissioner of health in New Jersey. A negro who was employed at Wrightstown until

July 5 was discovered to have smallpox July 26, and had been ill since July 17.

TENNESSEE

Hospital Opening Delayed.—The opening of the Riverside Hospital, Knoxville, which was to have taken place, July 1, was delayed two months on account of the difficulty of obtaining supplies and equipment.

Personal.—Dr. William M. McCabe, superintendent and surgeon of the Nashville City Hospital since 1890, has resigned, and expects to go to France with the Vanderbilt Hospital Unit. He has been succeeded by Dr. William F. Fessey.——Dr. George F. Aycock, Nashville, superintendent of the Davidson County Tuberculosis Sanatorium, has been ordered to report to the Army Medical School, Washington, D. C.——Dr. Edward E. Reisman has been elected chief of the staff of the Baroness Erlanger Hospital, Chattanooga, succeeding Dr. Jose M. Selden, resigned.——Dr. Benjamin L. Simmons, Granville, has been appointed a member of the state board of medical examiners, to succeed himself.

New Officers.—At the twenty-sixth annual meeting of the West Tennessee Medical and Surgical Association, held in Martin, May 24-25, Jackson was selected as the next place of meeting. The following officers were elected: president, Dr. William F. Clary, Memphis; vice presidents, Drs. Tazwell B. Wingo, Martin, and Christopher H. Johnston, Lexington, and secretary-treasurer, Dr. Isaac A. McSwain, Paris (reelected).——The East Tennessee Medical Association, at its annual meeting held in Dayton, elected the following officers: president, Dr. J. Morgan Clack, Rockwood; vice presidents, Drs. William P. McDonald, Spring City, and Edward T. West, Johnson City, and secretary-treasurer, Dr. William N. Lynn, Knoxville. The semiannual autumn meeting of the association will be held in Johnson City, and the annual meeting in Athens.

Report on Memphis Hospital.—A committee of the Memphis and Shelby County Medical Society, consisting of Drs. William Britt Burns, John C. Ayers, Alfred B. DeLoach and Newman Taylor, which was appointed to examine into conditions at the Emergency Hospital, requested by the budget committee of the county court, has recommended that Shelby County build a pellagra hospital on the grounds of the Home for the Aged and Infirm; that the present pellagra hospital be remodeled and used for an isolation hospital; that a duly qualified physician be secured as superintendent of the emergency hospital, and that a committee be appointed to cooperate with the county commissioners and county court in dealing with the pellagra and smallpox situations. The committee also condemned the sanitary and other arrangements at the present emergency hospital.

UTAH

Scarlet Fever.—Mayor Barnes of Kaysville, July 10, issued an order forbidding all public assemblies until further notice, on account of an epidemic of scarlet fever.

Pledge of Utah County Medical Society.—Members of the Utah County Medical Society have pledged to pay into the society's treasury an amount sufficient to give each of its members in the federal medical services $100 each month, for a period of three years, provided the member serves that long, and in case of death, while on duty, to pay his estate $100 a month for one year.

Personal.—Dr. Reinhold Kanzler has been appointed city physician of Ogden.——Dr. Walter E. Whalen has resigned to enter the Army Medical Corps.——Lieut. Williard Christopherson, M. C., Utah N. G., Salt Lake City, has been promoted to major, medical corps.——Dr. John S. Gordon, Ogden, who sustained a fracture of the hip recently in an automobile accident in Los Angeles, is making progress toward recovery. ——Dr. Murray R. Stewart, Salt Lake City, has been appointed a member of the staff of Salt Lake County Hospital.

VIRGINIA

Tuberculosis Stations Opened.—Twelve stations have been opened in Richmond by the Richmond Anti-Tuberculosis Association for the free examination for tuberculosis. Two physicians and two nurses are on duty at each station.

Southwestern Physicians Elect.—The annual meeting of the Southwestern Virginia Medical Society was held in Pulaski, June 27-28, and the following officers were elected: president, Dr. Wilson R. Cushing, Dublin; vice presidents, Drs. Zeb V. Sherrill, Marion, and John W. Preston, Roanoke, and secretary-treasurer, Dr. Alfred B. Greiner, Rural Retreat.

Personal.—Dr. Charles R. Anderson, Gore, has been appointed a member of the state board of health for a year from August 1.——Dr. John J. Lloyd, superintendent of the State Tuberculosis Sanatorium, Catawba, has accepted the superintendency of the Iola Sanatorium, Rochester, N. Y.—— The recommendation of Dr. Claude D. J. MacDonald, Norfolk, as medical assistant to the department of health has been approved.

Lack of Physicians.—The number of physicians of the state who have connected themselves with the Medical Reserve Corps of the Army and Navy has more than offset the recent graduates from medical schools, and has left at least thirty-seven cities in Virginia without sufficient physicians to care for the sick. For this reason, the state board of health invites communication from physicians who wish to take up practice or to change their present locations.

CANADA

Tuberculosis in Army.—More than 1,000 tuberculous soldiers have already been returned to Canada.

Coming Meetings.—The sixth annual congress of the Canadian Public Health Association will be held in Ottawa on September 27 and 28. The meeting of the Canadian Association for the Prevention of Tuberculosis will be also held in Ottawa on September 26.

Hospital News.—Mount Hamilton Hospital, Hamilton, Ont., was opened a short time ago by the Governor-General. Only one unit—the medical building—has been opened, but it is the intention to eventually have a hospital of ten units. The site of the institution is a beautiful one on Hamilton mountain. Dr. Langrill is the medical superintendent and worked very faithfully for the results already achieved.

Free Diagnosis of Syphilis.—Dr. John W. S. McCullough, Toronto, of the Ontario Board of Health announces that facilities have been provided in the laboratories of the province at Toronto, Kingston and London for the free diagnosis of venereal diseases. Outfits for taking specimens are supplied to physicians from either of these centers. Provision has also been made for the taking of specimens for the diagnosis of typhoid, diphtheria and tuberculosis; also sterilized bottles will be supplied for samples of water.

Baby Welfare.—Of every thousand babies born in Canada, one hundred and two die within twelve months. Recently, under the direction of Major John W. S. McCullough of the Ontario Board of Health, a week was devoted in Hamilton to acquiring information relative to the care and feeding of infants, the health of the mother and the attention she received at the time of the infant's birth, the financial position of the parents, and other causes bearing on the possible causes of infant mortality. The information will be tabulated in connection with the baby welfare movement in Ontario.

GENERAL

Mortality from Tuberculosis.—According to a bulletin of the Department of Commerce, the Bureau of the Census is planning the publication of a monograph on the mortality from tuberculosis covering the calendar year 1918. The cooperation of all physicians is asked to the extent of carefully recording or supervising the statements of occupations on the death certificates. Circular letters have been sent out inviting this cooperation. The value of the monograph will depend to a large extent on the accuracy of the information in regard to the occupation of decedents.

FOREIGN

Neurologic Quarterly Founded in Switzerland.—The new *Schweizer Archiv für Neurologie und Psychiatrie* is to be published irregularly, four times a year. Prof. C. von Monakow is the chief of the editorial staff and with him are associate Profs. P. Dubois, R. Weber, B. Manzoni and H. W. Maier. It is to be the organ of the organized neurologists and alienists of Switzerland, and is to be published by Füssli of Zurich.

The Ruffer Wards in the Greek Hospitals.—The death of Sir Armand Ruffer was mentioned recently in these columns (THE JOURNAL, June 2, p. 1642). The son of a French banker at Lyons, he won a high position in England and later in Egypt as the president of the public health and quarantine service there. It was while returning from organizing the public health service at Saloniki that the ship was torpedoed by a Teuton submarine. The minister of war of

Greece has now ordered that one ward in every hospital in the country shall be called the Ruffer ward. During his many years in Egypt, Ruffer spent much time in studying the pathology of the old dynasties, thus reconstructing the medical history of the Pharaohs by a kind of necropsy thousands of years postmortem.

Memorial Tablet for Oswaldo Cruz.—A large party of medical men and others who were delegates from the medical faculty of the University of Buenos Aires and other medical organizations of Argentina sailed to Rio de Janeiro recently to visit the profession at Rio. The party bore with them a large bronze tablet to be placed in the Bacteriologic Institute founded and directed by Oswaldo Cruz. An illustration of the graceful tablet is shown in the *Prensa Medica Argentina*, representing Argentine medical science, humanity and hygiene decorating with laurel the memorial inscription to the great hygienist who cleared Rio de Janeiro of yellow fever. A number of medical students accompanied the party. The physicians were welcomed by the authorities as guests of the nation during their stay. They also presented the Museum of Natural History with plaster casts of the five skulls on which F. Ameghino has based his anthropologic theory of the fossil American man.

Deaths in the Profession Abroad.—R. G. Menocal, professor of surgery at the University of Havana and secretary of the public health service.——**A. von Frisch,** professor of surgery and chief of the urologic clinic of the University of Vienna, author of numerous works on the pathology of the prostate and other urologic subjects, aged 68.——**R. Alvarez,** chief of the clinical service connected with the chair of psychiatry at Buenos Aires, aged about 27.—**A. Gabryszewski,** professor of surgery at the University of Lemberg.——**P. Hirtz,** of Colmar, at an advanced age.——**G. Clarac,** a young member of the editorial staff of the *Archives des maladies du cœur*.——**C. M. Ullman** of Göteborg, member of the Swedish Medical Association since 1866, aged 84.——**L. Orlandini,** an army surgeon and professor of the Colegio Nacional at Buenos Aires. From the latest casualty lists: In England: **Capt. W. A. Sneath, Capt. H. E. Rose, Capt. A. G. Peter, Lieut. B. Cohen, Lieut. J. E. Foreman, Lieut. J. G. Bradley-Smith, E. Rayner, E. Cox, W. G. Barras.** In Italy: **Lieut. P. Puviani, Lieut. G. Alliaud, Capt. E. Fergola, G. Bollatti.**

Death of Kocher.—The cable brings word of the death of the Swiss surgeon, Theodor Kocher, professor of surgery at the University of Berne, Switzerland, aged 76. He was the pioneer in operative treatment of goiter, and this has perhaps carried his fame the farthest, but he has published well over a hundred works on various branches of surgery, reporting important contributions to the science. Among them were his works on the surgery of the male sexual organs, excision of rectal cancer by resection of the coccyx, and operations on the digestive tract, on hernia, spastic contracture, and surgery of the brain and spinal cord. He attracted attention as early as 1866 by his research on the arrest of hemorrhage, and reduction of dislocation of the shoulder, and was called to the chair of surgery at Berne when only 31, where he has since remained. In 1874 he published an argument in favor of thyroidectomy, and by 1911 he had performed 4,629 operations on goiter with no infectious complications in the last thousand, and the list has grown steadily since. His description of cachexia strumipriva dates from 1883, and his research on cretinism and hyperthyroidism may be said to have been the starting point for our present knowledge of the glands with an internal secretion. Kocher was awarded the Nobel prize in medicine in 1909, and in 1912 he presented the university with an endowment fund of $40,000 for promotion of research in the medical sciences. He stipulated that the interest should be allowed to accumulate until the fund totaled $100,000, which he figured would be about the time the university was celebrating its centennial in 1934. At one time he was president of the German Surgical Association, and of the international committee of the International Surgical Congresses. The list of his works in the Surgeon-General's Catalogue of 1903 fills over two columns, and he has published much since. The blood platelet extract which he worked out with Fonio as an effectual means to arrest hemorrhage he is said to have presented freely to the warring governments at the beginning of the war, donating large quantities besides the information as to the technic for its preparation. Some of his works have been translated into different languages, and two Festschrifts have been published in his honor, one on the twenty-fifth and one on the fortieth anniversary of his entrance into the university faculty.

LONDON LETTER

LONDON, July 18, 1917.

The War

A CRISIS IN MILLING

When the government passed a law compelling an extraction of 78 per cent. of flour from the wheat berry, it laid a somewhat severe burden on the great roller millers, who had been wont to regard a 72 per cent. extraction as the secret of good milling, and had left 28 per cent. of the berry to go to live stock and poultry feeding. The great mills, however, adapted themselves to the new conditions, and supplied a loaf quite as palatable as its predecessor. But under the stress of circumstances the government introduced two changes which between them have resulted in the most formidable crisis known to modern milling. The first was to raise the percentage of extraction from 78 to 81, and the second to order the incorporation of a material percentage of cereals other than wheat. It is the latter requirement which has principally led to a breakdown at the mills. The incorporation of cereals other than wheat in the loaf made the production of a homogeneous flour very difficult, but skilled operatives could have faced the situation with some degree of hopefulness if "the other cereal" had been specified. Rice, maize, maize semolina, barley, rye and oats all admit of special treatment as incorporations with wheat. Millers relied on finding a public for this or that addition. Then there came the prohibition of the sale of bread with any specified addition. The miller now gets first one addition, then another, and the local mill's supply is governed by the arrivals of cereals other than wheat at the nearest ports. Complaints have been loudest from places where the addition is believed to have been maize. The result of the new high extraction, combined with the confused and varying additions, was found by the end of June to be such chaos and so much dispute that the Millers' Association agreed by a unanimous vote to make a stand. Having to break with the government, the association decided on a bold policy and to demand a 76 per cent. wheat extract. Thus the whole forward policy marked by the successful 78 per cent. load is imperiled. Should the master millers repudiate the task of making flour under the present requirements, the government officials, already in nominal charge of the mills, may hire experts in the place of the masters. Luckily the crisis has occurred at a time when the national consumption of bread is at an ebb.

Increase of 104 Per Cent. in Food Prices Over Figures Before the War

Official statistics show that on an average there has been an increase in food prices of 104 per cent. compared with July, 1914, the month before the war began. The increase varies from 65 per cent. in the case of fresh butter to 191 per cent. in the case of certain parts of frozen mutton. The average price of bread — 23 cents for the 4 pound loaf — is double that in July, 1914, and flour shows a proportionately greater advance, amounting to 109 per cent. The price of granulated sugar had risen over the war period from an average of about 4 cents to nearly 12 cents per pound, but increased duty accounts for about 2.5 cents of the rise. The average price of cheese is slightly more than double than in July, 1914; that of eggs, slightly less than double. The price of tea is 74 per cent. higher, but about half of the advance is due to increased taxation. Butter and margarin show increases approximating to 65 and 74 per cent., respectively, over prewar prices. Milk prices had risen 60 per cent., or 4 cents per quart. In arriving at the general percentage increase, the several articles are weighted in accordance with the proportionate expenditure on them in prewar family budgets, no allowance being made for the economies resulting from changes in dietary which have been effected since the beginning of the war, especially in those families in which the total income has not been increased by advances in rates of wages, greater regularity of employment, increased output, or the working of overtime. As an illustration of possible economies in this direction, if eggs are omitted from the dietary, margarin substituted for butter, and the consumption of sugar and fish reduced to one half of that prevailing before the war, the general percentage increase since July, 1914, instead of being 104, would be 72. During last month alone the general level of retail prices of the principal articles of food rose about 1 per cent. The prices of British beef increased about 5 per cent., and those of other meat from 3 to 4 per cent. Bacon and fish showed some decline in price as compared with a month ago

Marriages

ASST. SURG. ROBERT HOWARD MCMEANS, U. S. N., Pensacola, Fla., to Miss Julia Rock of San Antonio, Tex., at New Orleans, July 19.

ASST. SURG. LYLE DEE MCMILLAN, U. S. N. R., Detroit, to Miss Birdie Leona Knowles of Vincennes, Ind., at Cleveland, July 22.

TOM RAY KNOWLES, M.D., to Miss Adele Berta Hexter, both of Colorado Springs, Colo., at Gunnison, Colo., July 23.

LIEUT. ADDLEY H. GLADDEN, JR., M. O. R. C., U. S. Army, Monroe, La., to Miss Le Reine Hill of New Orleans, July 25.

HOWARD LESTER FARQUHAR, M.D., Pittsburgh, to Miss May Frances Geiser of Smithburg, Md., recently.

FLOYD BURKE GILLESPIE, M.D., Brooklyn, to Miss Amanda Poulson of Omaha, in Brooklyn, July 20.

WILLIAM EMERSON PREBLE, M.D., Boston, to Mrs. Helen Smiley Phelps of Dixburg, Miss., July 6.

BENJAMIN HARRISON GILLESPIE, M.D., to Miss Edna Pearl Clawson, both of Akron, Ohio, April 30.

CHARLES CLIFFORD PINKERTON, M.D., to Miss Maude McPherson, both of Akron, July 24.

MILTON EDWARD ROSE, M.D., Chicago, to Miss Dorothy J. Shade of Decatur, Ill., July 21.

PHILIP R. WAUGHOP, M.D., to Mrs. Anna Fletcher Olmstead, both of Seattle, July 10.

GIBBS BISCOE, M.D., Penndleton, Ark., to Miss Evan Goree of Pine Bluff, Ark., July 25.

JOHN FLEMING DICKS, M.D., to Miss Ethel Reily, both of New Orleans, July 25.

ALBERT N. BAGGS, M.D., to Mrs. Ida V. Fagan, both of Philadelphia, July 26.

MAX PETER GETHNER, M.D., to Miss Lillian Livshis, both of Chicago, recently.

Deaths

Albert Wellington Smith, M.D., Milford, N. H.; Dartmouth Medical School, Hanover, N. H., 1886; aged 64; formerly a Fellow of the American Medical Association; a member of the New Hampshire Medical Society, for forty years a practitioner of Milford; for ten years town moderator; for twenty years a member of the school board, and from 1881 to 1890, representative in the state legislature; died at his home, July 21, from carcinoma of the bladder.

Edward George Rave, M.D., Hicksville, N. Y.; New York University, New York City, 1877; aged 73; formerly coroner and health officer of Oyster Bay, N. Y.; a member of the Medical Society of the State of New York; formerly vice president of the College of Pharmacy of Brooklyn; for thirty-five years chief surgeon of the Long Island Railroad; died at his home, near Hicksville, L. I., July 24.

Henry Edward Waite, M.D., New York City; Eclectic Medical College of the City of New York, 1885; aged 71; a Fellow of the American Medical Association; who had devoted his life to the manufacture of electrical medical apparatus, and was the president of the Waite and Bartlett Manufacturing Company; died at his summer home, in Bethel Park, N. Y., July 26, from heart disease.

Louis C. B. Graveline, M.D., Nassau, N. Y.; Albany, N. Y., Medical College, 1862; aged 80; a veteran of the Civil War; for twenty years local surgeon of the Boston and Albany Railroad at Albany; police surgeon for two years, and for five years physician of Columbia County; one of the founders of the Albany Zouave Cadets; died at his home, July 22, from cerebral hemorrhage.

Livius Lankford, M.D., Norfolk, Va.; New York University, New York City, 1868; aged 61; a Fellow of the American Medical Association; president of the board of health, Norfolk, for several years; a member of the Virginia Examining Board, from 1886 to 1890; July 18, while drilling with the home guard of his ward, died suddenly from myocarditis.

William Anderson, M.D., Trenton, N. J.; College of Physicians and Surgeons, Chicago, 1888; aged 59; president of the Anderson Rain-Proof Coat Company, Trenton, and the New Jersey Pulp Plaster Company; was accidentally drowned in the Delaware and Rariton Canal, Trenton, July 7.

Isaac Stover Long, M.D., Freehold, N. J.; University of Pennsylvania, Philadelphia, 1866; aged 76; a Fellow of the American Medical Association; for more than thirty years treasurer of the Monmouth County (N. J.) Medical Society; died at his home, May 11, from senile debility.

James Dwight, M.D., Boston; Harvard Medical School, 1879; aged 65; a member of the Massachusetts Medical Society; for nineteen years president of the United States National Lawn Tennis Association; died at his summer home at Mattapoisett, Cape Cod, July 14.

Theron Dyke Jenkins, M.D., Winthrop, N. Y.; University of Vermont, Burlington, 1913; aged 26; a member of the Medical Society of the State of New York; was instantly killed by a man while making a professional call in Stockholm, N. Y., June 21.

Sarah A. French Battey, M.D., New York City; Woman's Medical College of the New York Infirmary for Women and Children, 1887; aged 56; formerly a member of the New York Academy of Medicine, died at her home, July 26.

Harry Wallace Haskell, M.D., Brooklyn; New York University, New York City, 1891; aged 52; formerly a member of the Medical Society of the State of New York; died at the home of his sister in Brooklyn, July 28.

George Benton Reynolds, M.D., Scranton, Pa.; University of Pennsylvania, Philadelphia, 1891; aged 47; formerly a Fellow of the American Medical Association; died at his home, July 26, from brain abscess.

Albert Claude Bowerman, M.D., Strathmore, Calif.; University of Toronto, Ont., 1876; aged 67; formerly a Fellow of the American Medical Association; died at his home, May 28, from cerebral hemorrhage.

Lewis Marion Perry, M.D., Broadwell, Ill.; University of Louisville, Ky., 1868; aged 80; formerly a Fellow of the American Medical Association; died at his home, July 17, from neuritis.

Thomas Dyson Walker, M.D., St. John, N. B.; University of Edinburgh, Scotland, 1891; aged 50; died in the Massachusetts General Hospital, Boston, July 22, from chronic nephritis.

James Allen Nichols, M.D., New York City; Long Island College Hospital, Brooklyn, 1883; aged 58; a member of the Medical Society of the State of New York; died at his home, July 28.

Robie Blake, M.D., Cornish, Me.; Eclectic Medical College of Maine, Lewiston, 1884; aged 79; inventor of the solid black carbon transmitter for telephones; died at his home, July 27.

S. Walter Scott, M.D., Troy, N. Y.; University of Vermont, Burlington, 1867; aged 71; for twenty-seven years a practiitoner of Troy; died at his home, July 22, from heart disease.

Charles Yoke, M.D., Bridgeport, Ind.; Medical College of Indiana, Indianapolis, 1879; aged 60; a member of the Marion County Council; died at his home, July 20, from pneumonia.

George W. Hughes, M.D., Armstrong, Ill.; Illinois Medical College, Chicago, 1900; aged 44; a Fellow of the American Medical Association; died at his home, June 9.

Paul Emory Gervais, M.D., Arctic, R. I.; Victoria University, Coburg, Ont., 1887; aged 54; also a druggist; died at his home, June 10, from tumor of the glottis.

Harvey H. Converse, M.D., Eastford, Conn.; American Eclectic Medical College, Cincinnati, 1878; aged 70; died at his home, July 16, from heart disease.

George Pyburn, M.D., Sacramento, Calif.; Cleveland University of Medicine and Surgery, Cleveland, Ohio, 1859; aged 86; died at his home, July 20.

William E. Cox, Carters Creek, Tenn. (license, Tennessee, 1889); aged 63; died at his former home in Theta, Tenn., July 8.

Burdette Ramsey, M.D., Paint Lick, Ky.; Medical College of Ohio, Cincinnati, 1857; aged 92; died at his home, July 13.

Franklin B. Lauderbaugh, M.D., James Creek, Pa.; University of Maryland, Baltimore, 1883; died at his home, June 26.

James A. Bradford, M.D., Macedonia, Ill.; University of Louisville, Ky., 1910; aged 33; died at his home, June 28.

George Edward Wilson, M.D., New York City; New York University, New York City, 1887; died about July 23.

John Charles McEnery, M.D., Chicago; Rush Medical College, 1897; aged 48; died at his home, about July 9.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

TRIMETHOL

Report of the Council on Pharmacy and Chemistry

Trimethol is the trade name for a substance said to be trimethyl-methoxy-phenol of the formula $C_6H(CH_3)_2(OCH_3).OH$ — 1:2:4:5:6, originated by J. T. Ainslie Walker. It is sold as a nontoxic germicide, having a Rideal-Walker phenol-coefficient of 40, even in the intestinal canal. It is described as insoluble in water and not to be decomposed in the alimentary tract, and to be excreted unchanged in the feces.

Trimethol itself is not obtainable. Pharmaceutical preparations—Trimethol Syrup, Trimethol Capsules and Trimethol Tablets, said to contain Trimethol—are prepared by The Walker-Leeming Laboratories and sold by Thos. Leeming and Co., New York.

The Trimethol preparations are advertised for use in all conditions dependent on intestinal putrefaction. The advertising claims made are very extensive and some of them give to "Trimethol" the scope of a panacea. For example:

"Physicians are constantly reporting cases where Trimethol has been especially efficient, and describing conditions (until recently not associated with intestinal infection) which have been distinctly benefited by its use. This would seem to bear out the contentions of Charcot and Metchnikoff that 90% of all human ailments have their origin in intestinal infection.

"The careful practitioner, when in doubt, will bear this in mind, now that we have a really efficient and non-toxic intestinal germicide—not a mere antiseptic."

The Walker-Leeming Laboratories have not formally requested the Council to consider the Trimethol preparations, though in a personal letter to a member of the Council, J. T. Ainslie Walker invited an investigation of his compound.

For the investigation of Trimethol and its preparations the Council secured the aid of a bacteriologist who has given much attention to the study of the intestinal flora. The Walker-Leeming Laboratories and J. T. Ainslie Walker were both asked to submit details of experimental studies and also to furnish a supply of the pure "Trimethol." But the only data sent that had any definiteness set forth the bacterial counts made of plate cultures of stools of one patient before and after the administration of Trimethol Capsules.

REFUSE TO FURNISH TRIMETHOL

The request for the pure substance was refused on the grounds that the substance was not used in the undiluted form. The failure to furnish the chemical substance claimed as the essential constituent of the Trimethol preparations is to be deprecated if indeed it has not greater significance. At least it made it impossible for the Council's expert to express his results in terms of absolute Trimethol of established composition. The data obtained apply only to the market preparations claimed to contain Trimethol. So far as the investigation and report go, "Trimethol" is a hypothetical substance.

Clinical or animal tests of the asserted intestinal antiseptics have hitherto given equivocal results because it is impossible, on the one hand, to predict the course of any intestinal infection, or, on the other hand, to determine what effect, if any, was produced by administration of the medicament. It therefore seemed unwise to undertake this line of investigation until the more direct laboratory bacteriologic methods had been exhausted. Consequently the investigator checked, in the first place, the phenol-coefficient of one of the Trimethol preparations and then also determined its "penetrability" coefficient. Although by both methods Trimethol was found to be a germicide, the results did not indicate any remarkable potency or other properties, suggesting that the drug possessed special therapeutic value. From the results obtained it appeared inadvisable to proceed further with the work until more definite evidence of the nature and of the value of the substance should be at hand. The report of the bacteriologic investigation follows:

THE BACTERIOLOGIST'S REPORT

"I have made no attempt to study the effects of internal administration of Trimethol on the intestinal flora. The methods available at the present time of enumerating the numbers of *viable* bacteria in the feces are probably not accurate within one hundred per cent. and the precision of such determinations is equally variable. The physiologic factors involved are so complex that they would appear to make a really valuable assay a question of many months' careful study. If it were possible to administer known amounts of Trimethol as such, the problem might be worth while; inasmuch as the available reactive substance is not at present quantitatively assayable, this phase of the investigation barely seems practicable.

"'Trimethol Syrup,' as such, appears to be about ten per cent. as efficient in its germicidal value as carbolic acid. If the assay, ¾ m. Trimethol per drm. (as the label indicates), is correct, the substance would appear to possess germicidal merit provided enough could be administered, if it is not influenced by passage through the stomach.

"A package containing four four-ounce bottles labeled 'Trimethol, A Non-Toxic Germicide SYRUP Representing ¾ m. Trimethol per drm., Alcohol 1½ per cent.' was received at the laboratory December 15, 1916. Later a smaller package containing, according to label, 100 Trimethol tablets, each 5 gr., representing 1¼ m. Trimethol was received. The tablets were apparently chocolate coated.

"Two separate series of tests[1] were made upon the syrup. (*a*) PHENOL COEFFICIENT, using the method outlined in *Bulletin No. 82*, Hygienic Laboratory, Method of Standardizing Disinfectants With and Without Organic Matter. (*b*) A PENETRABILITY COEFFICIENT by the method of Kendall and Edwards, *Journal of Infectious Diseases*, **8**, 250.

"The PENETRABILITY COEFFICIENT resulted as follows: A 5 per cent. solution of phenol killed *Bacillus coli*, suspended uniformly throughout a cylinder of 1.2 per cent. agar in the interval between 60 and 90 minutes. A one per cent. solution of phenol killed the same organisms under the same conditions in the interval between two and one-half and three hours. An undiluted solution of Trimethol Syrup killed the organism in the interval between two and one half and three hours. A ten per cent. solution (nine volumes of distilled water to one volume of Trimethol Syrup) failed to kill the organisms in four hours. It would appear that undiluted Trimethol Syrup has the same combined penetrability and germicidal value as a one per cent. phenol solution.

"The PHENOL COEFFICIENT: A ten per cent. solution of Trimethol Syrup in distilled water (nine volumes of distilled water to one volume Trimethol Syrup) possesses the same germicidal power as a one per cent. solution of carbolic acid. This coefficient takes no cognizance of the *actual amount of Trimethol as such*—it merely indicates the relative germicidal power of the Trimethol Syrup as sold."

The preceding report shows that Trimethol Syrup has a phenol coefficient of 1/10, and assuming Trimethol Syrup contains the amount of Trimethol declared, the substance Trimethol would have a phenol coefficient of 8⅓ instead of 40, as is claimed. According to Kendall and Edwards' method, the penetrability-germicidal value of the syrup is equal to a 1 per cent. solution of phenol.

WALKER'S REPLY TO CRITICISM

The report of the bacteriologist was submitted to The Walker-Leeming Laboratories for comment. The following reply was received from J. T. Ainslie Waker:

(*May 22, 1917*) "In reply to your letter of the 15th inst., which has just been placed before me on my return to town, I have to inform you that the potent constituent of Trimethol Tablets and Trimethol Syrup is not fully available as a bactericide until it comes in contact with the pancreatic fluid.

"As you will see from the enclosed extracts from clinical reports, the therapeutic value of Trimethol has been well established.

"As regards penetrability, no claim has ever been made for Trimethol in this connection; and, as I pointed out in my original paper (*American Medicine*, September, 1914), when referring to the independent tests made by Dr. Frederick Sondern, 'No attempt was made to determine the bacterial content of the solid particles, as in the opinion of the writer sterilization of the interior of these particles is not only absolutely impossible, but wholly unnecessary. The fact of the fluid contents of

1. The details of the tests are omitted from this report but will appear in the Annual Council Reports.

the canal being sterile may be taken to indicate that the exterior of all solid particles is in a like condition, and therefore harmless. It is the organisms in the fluid portions only that produce the deadly effects through the chemical substances they secrete; those in the interior of the solid portions (*i.e.*, as evacuated) may be disregarded, as they are not available for good or evil.'

"I must confess to no little surprise on learning that your investigator is still using the Hygienic Laboratory method of determining phenol coefficients. I would respectfully suggest that you call his attention to the critical comparison of the Hygienic Laboratory and R.-W. Tests, which he will find in the enclosed reprint from the *New York Medical Journal* of March 11, 1916.—'Instead of being an improvement upon the standard R.-W. Test, the so-called Hygienic Laboratory Method is so defective as to be wholly unreliable, and incapable of furnishing results of any scientific or practical value whatever.'"

As to the statement that the potent constituent of Trimethol Tablets and Trimethol Syrup is not fully available as a bactericide until it comes in contact with the pancreatic fluid, attention is called to a leaflet, which accompanies each bottle of Trimethol Syrup, that reads:

"Trimethol is insoluble in water, but when properly emulsified has a Rideal-Walker co-efficient of 40; that is to say, it is 40 times more efficient as a germicide than phenol (pure carbolic acid)."

The Trimethol Syrup which was used in the investigation, when mixed with water produced an almost perfectly transparent solution, which justifies the assumption that the proper physical conditions were observed and that this objection is not well founded.

As regards the relation of pancreatic fluid to bactericidal availability of Trimethol, there is little to say, other than that the published statements in the advertising accompanying the packages make no mention of this point. It would be interesting to know what, if any, relation the pancreatic fluid has to this substance in view of the statement that it "has a Rideal-Walker co-efficient of 40."

The Trimethol "literature" does not throw light on the question, What is the germicidal value of Trimethol Syrup as compared with phenol? The only available method of determining the germicidal value of a liquid disinfectant is to make a direct comparison of the substance in question with phenol under similar conditions. Given parallel conditions, not obviously prejudicial to the substance tested in contrast to the standard solution, the results are comparable, and furnish a basis for estimating the relative germicidal power of the two substances. In the investigation, Trimethol Syrup and phenol were thus compared.

As regards the contention that the bacteria within fecal masses are harmless, this may be granted. But it must also be admitted that these intestinal masses are constantly being reformed so that buried micro-organisms do not remain in the interior. For this reason, the determination of the penetrability coefficient of a germicide is pertinent.

Regarding the respective merits of the old Rideal-Walker and the newer U. S. Hygienic Laboratory method of determining the phenol coefficient, the Rideal-Walker method was found to possess certain drawbacks, and in an attempt to overcome these the "*Lancet* Method" was evolved; this method in turn was improved in the U. S. Hygienic Laboratory and led to the United States Public Health Service Hygienic Laboratory method for the determination of the phenol coefficient of disinfectants (published in *Hygienic Laboratory Bulletin 82*). In 1913 this method was formally adopted by the Council for the valuation of disinfectants or germicides of the phenol type, and the method is now in general use for this purpose in the United States.[1] In this connection Hiss and Zinsser may be quoted (Ed. 2, page 80): "The most precise method of standardizing disinfectants is that now in use in the United States Public Health Service." Stitt, director of the United States Naval Medical Schools, in his Practical Bacteriology, Blood Work and Parasitology (Ed. 4, page 473) says: "In the United States disinfectants are rated according to the Hygienic Laboratory Phenol Coefficient."

1. Those who are interested in the relative merits of the Rideal-Walker, the *Lancet* and the Hygienic Laboratory methods for the valuation of disinfectants should read the following: Method of Standardizing Disinfectants with and without Organic Matter, THE JOURNAL A. M. A., Aug. 24, 1912, p. 667. Standardization of Disinfectants, Report of the Council on Pharmacy and Chemistry, THE JOURNAL A. M. A., April 26, 1913, p. 1316; Standardizing Disinfectants, THE JOURNAL A. M. A., Sept. 30, 1916, p. 883.

The Council adopted the recommendation of the Committee on Pharmacology to the effect that the claims made for Trimethol are unsupported by acceptable evidence. Accordingly, Trimethol and the pharmaceutical preparations said to contain it—Trimethol Syrup, Trimethol Capsules, and Trimethol Tablets—were held ineligible for New and Nonofficial Remedies.

Correspondence

PRIORITY FOR SIMPLIFIED METHOD FOR DETERMINING THE ISO-AGGLUTININ GROUP

To the Editor:—It is of interest to note that the simplified method for determining the iso-agglutinin group, by W. L. Moss (THE JOURNAL, June 23, 1917, p. 1905) is substantially the same as that used by me, and described in the *Journal of Laboratory and Clinical Medicine*, October, 1916. Two points given by me, however, should be emphasized: The serums of Groups II and III should be especially strong in agglutinins to prevent error. Moreover, the use of Group IV serum is of value, as noted by me, for a control in case the agglutinins of the other groups happen to have weakened.

NORMAN E. WILLIAMSON, M.D., Stockton, Calif.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

GUIDE TO FRENCH

To the Editor:—I want a small elementary guide to French, one that would give those of us who may go to France a sufficient knowledge of French to get along. Please do not use my name if you publish this. M. R. C.

ANSWER.—The following books have been especially prepared for this purpose:

Wilkins, Coleman and Preston: First Lessons in Spoken French for Doctors and Nurses, Chicago, University of Chicago Press, 54 cents, postpaid.

Wilkins, Coleman and Huse: First Lessons in Spoken French for Men in Military Service, Chicago, the University of Chicago Press, 54 cents, postpaid.

Gallichan, Walter M.: The Soldiers' English and French Conversation Book, Philadelphia, J. B. Lippincott Company, 30 cents.

Plumon, Eugène: Vade-Mecum, New York, Brentano's, 75 cents.

The books by Wilkins, Coleman and Preston and by Plumon contain portions especially adapted for medical officers. The Vade-Mecum contains much special information in the way of tables, measures, abbreviations, etc.

PICA—EATING DIRT

To the Editor:—I have a boy 2 years old who is in perfect physical condition in all respects, but who persists in eating dirt or sand or anything with earth in it. Will you tell me what is lacking in his system which causes this phenomenon, and what I can give him to relieve the situation? C. O. Y.

ANSWER.—The habit of dirt eating, called pica, occurs as a neurosis in children between the first and second years, and sometimes in older persons, as a form of perverted appetite. In most of these cases earth, cinders, etc., may be consumed with avidity, whereas ordinary food is refused. Such patients become thin, sallow and unhealthy looking, and suffer from colic and diarrhea. The condition is usually curable by prevention, by producing free evacuation, and by supplying plenty of wholesome food. In case the habit is associated with mental deficiency, the treatment is directed toward that condition. The condition is psychologic, not physiologic, in character, and must be treated from a psychologic point of view.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. R. W. Benz, 1141 Alakea St., Honolulu.

MASSACHUSETTS: Boston, Sept. 11-13. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

REPORT OF SECOND EXAMINATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

The second examination of the National Board of Medical Examiners was held in Washington, D. C., June 13-21, 1917. Of the twenty-seven who applied, twenty-five were found to have the essential preliminary and medical qualifications, and thirteen of these appeared for the examination (see table, bottom of page), the others having been ordered on active duty.

The subjects of the examination and the relative value of each were: anatomy, 100; physiology, 75; chemistry, 75; pathology, 50; bacteriology, 50; materia medica, pharmacology and therapeutics, 75; medicine, 200; surgery, 200; obstetrics and gynecology, 100; hygiene and sanitation, 50, and medical jurisprudence, 25. A percentage of 75 was required to pass. Falling below 65 in more than two subjects, or below 50 in more than one subject, constituted a failure. The following colleges were represented:

PASSED

Name and College	Year of Graduation
Adrian Stevenson Taylor, University of Virginia and Harvard Medical School	1905 and 1916
George B. Packard, Harvard Medical School	1914
Roscoe Clayton Webb, Johns Hopkins	1914
Walter Philip Kreichbaum, Northwestern University	1914
Arthur Beck Hamilton, University of Pennsylvania	1915
Douglas Power Murphy, University of Pennsylvania	1916
Clarence Stiles McKee, University of Pennsylvania	1915
James Lancelot Wilson, Columbia University, College of Physicians and Surgeons	1916
Harvey Welton Snyder, Atlanta Medical College	1916

FAILED

College	Year of Graduation
University of Michigan	1909
Northwestern University	1905
McGill University	1916

RESULT OF EXAMINATIONS FOR MEDICAL DEPARTMENT OF THE NAVY

The following are the combined figures of two examinations held in April and May of this year of members of the Naval Reserve Force for commissions in the Medical Corps, U. S. Navy. Four hundred and eighty-six were examined, and of these 369 found qualified professionally, that is, 76 per cent.

The first ten honor men were graduates of the following institutions, in the order indicated:

1. Pennsylvania	1917	6. Northwestern	1917
2. Northwestern	1915	7. Western Reserve	1916
3. Harvard	1917	8. Northwestern	1917
4. Rush	1917	9. Georgetown	1917
5. Washington	1917	10. Harvard	1917

Thus of the first ten, Northwestern led with three, Harvard had two, and Pennsylvania, Rush, Washington University, Western Reserve and Georgetown, one each.

Of the first twenty-five, Harvard led with four, Northwestern and Rush had three each, Pennsylvania and Illinois had two each, and Washington University, Western Reserve, Georgetown, Minnesota, Tulane, California, Cornell, Pittsburgh, Atlanta, Vermont and Tennessee, one each.

Medical College	Number Examined	Number Passed	Percentage Passing	Average of Passing Marks	Standing by Passing Marks
University of Minn., Med. School	16	16	100	80.64	18
Med. School of Harvard Univ.	14	14	100	83.20	4
George Wash. Univ., Med. School	11	11	100	80.10	22
Johns Hopkins Univ., Med. Dept.	8	8	100	80.82	14
Tulane Univ., School of Med.	8	8	100	80.50	20
Univ. of Pitts., School of Med.	5	5	100	79.26	32
Columbia Univ., Col. of P. & S.	3	3	100	81.06	11
Univ. of Virginia, Dept. of Med.	3	3	100	79.86	25
Cornell Univ., Med. College	2	2	100	82.80	3
Yale Univ., School of Medicine	2	2	100	78.40	39
Syracuse Univ., Col. of Medicine	2	2	100	75.90	54
Boston Univ., School of Medicine	1	1	100	75.00	57
Bowdoin Medical School	1	1	100	81.90	6
Univ. of Buffalo, Dept. of Med.	1	1	100	81.00	12
McGill Univ., Faculty of Med.	1	1	100	80.00	23
Univ. of N. Carolina, Sch. of Med.	1	1	100	75.00	58
Univ. of North Dakota	1	1	100	81.00	13
Temple Univ., Dept. of Med.	1	1	100	76.80	52
Western Reserve Univ., Sch. of Med.	1	1	100	88.90	1
Univ. of Penn., School of Med.	16	16*	100	80.67	17
Rush Med. College (Univ. of Chi.)	15	15*	100	82.55	5
Univ. of California Med. School	11	10*	91	81.29	10
Univ. and Bellevue Hosp. Med. Col.	9	8	89	79.70	28
Washington Univ. Med. School	8	7	88	81.70	8
Northwestern Univ., Sch. of Med.	8	7	88	84.20	2
Atlanta Medical College	8	7	88	80.60	19
Univ. of Michigan, Med. School	8	7	88	78.14	42
Long Island College Hospital	8	7**	88	79.50	30
Univ. of Illinois, Col. of Med.	14	12†	86	79.70	28
Univ. of Colorado, School of Med.	7	6	86	78.48	37
Jefferson Med. College of Phila.	25	21	84	79.47	31
Univ. of Alabama, School of Med.	6	5	83	77.80	46
St. Louis Univ., School of Med.	11	9	82	80.81	16
Leland Stanford Jr. Univ. Sch. M.	16	13	81	78.64	36
Univ. of Texas, Dept. of Med.	5	4	80	81.37	9
Georgetown Univ., School of Med.	5	4*	80	80.82	15
Univ. of Maryland, School of Med.	15	12†	80	77.95	44
Univ. of Kansas, School of Med.	9	7	78	76.87	51
Hahnemann Med. Col. & Hosp.	4	3	75	81.86	7
State Univ. of Iowa, Col. of Med.	4	3*	75	79.06	33
Univ. of Tennessee, Col. of Med.	11	8	73	79.80	26
Indiana Univ., School of Med.	11	8	73	77.52	49
Univ. of Oregon, Dept. of Med.	7	5*†	71	78.34	40
Medical College of Virginia	26	18†††	69	78.70	35
Marquette Univ., School of Med.	9	6*†	67	78.15	41
Univ. of Vermont, Col. of Med.	8	5	63	79.80	27
Medico-Chirurgical Col. of Phila.	8	5	63	76.78	53
Vanderbilt Univ., Med. Dept.	17	10	59	79.60	29
Ohio State Univ., College of Med.	10	5	50	78.42	38
Univ. of Georgia, Med. Dept.	2	1	50	78.10	43
Univ. of Neb., College of Med.	2	1	50	75.80	55
Chicago College of Med. & Surg.	2	1	50	75.10	56
Tufts College, Medical School	18	9††	50	77.40	50
Medical Col. of State of S. Carolina	13	6†	46	77.85	45
Fordham Univ., School of Med.	7	3	43	78.76	34
Univ. of Louisville, Med. Dept.	18	7*†	39	77.58	48
Detroit Col. of Med. & Surg.	12	4*	33	77.65	47
John A. Creighton Med. Col.	8	2	25	80.35	21
Univ. of Arkansas, Med. Dept.	1	0†	...	.....	61
Albany Medical College	1	0†	...	.....	60
Birmingham Medical College	1	0	...	.....	59

* Each star represents one candidate who failed on first examination, but passed on second.

† Each dagger represents one candidate who failed on both examinations.

AVERAGES OBTAINED IN THE EXAMINATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

Subjects	Candidates by Number												General Aver. by Subjects
	1	2	3	4	5	6	7	8	9	10	12	13	
Anatomy	82	82	54	98	42	79	78	60	82	82	81	86	76.3
Chemistry	66	77	70	87	67	80	76	85	67	81	79	81	76.1
Pharmacology, materia medica and therapeutics	90.5	90	77	94	69.2	90	88	84	90	90	90	90	87
Obstetrics	80	95	84	93	60	77	70	75	80	75	85	85	79.7
Hygiene	77.5	80	70	85	66	79	76	70	66	67	81	76	74.4
Medicine	88	83.5	78	96	67.5	86	81	76	83.5	84.5	91	87.5	83.5
Surgery	76	85.5	47	82	59	81	73	68.5	69	88.5	87	77.5	76.2
Pathology	78	84	57	90	60	80	77	74	71	73	90	88	76.2
Bacteriology	80	80	69	92	74.5	70	79	66	69	82	80	79	75.9
Physiology	86	87	70	95	72	75	83	75	80	88	90	77	78.9
Medical jurisprudence	80.3	82	85	90	56	89	58	75	78	92	88	73	80.6
General average of candidates	80	83	69	91	63	79	76	72	75	82	85	81	

Book Notices

Operative Surgery of the Nose, Throat, and Ear, for Laryngologists, Rhinologists, Otologists, and Surgeons. By Hanau W. Loeb, A.M., M.D., Professor of Ear, Nose and Throat Diseases in St. Louis University; in Collaboration with Joseph C. Beck, M.D., George W. Crile, M.D., William H. Haskin, M.D., Robert Levy, M.D., Harris P. Mosher, M.D., George L. Richards, M.D., George F. Shambaugh, M.D., and George B. Wood, M.D. In Two Volumes, Volume 2. Cloth. Price, $7. Pp. 427, with 476 illustrations. St. Louis: C. V. Mosby Company, 1917.

The first volume of this work appeared several months ago, and now with this volume, the complete work furnishes a valuable contribution to the literature of this special field of surgery. In any treatise on operative surgery, illustrations, if well reproduced, are invaluable concomitants to the text. The author of this work cannot be too highly complimented on the character of the unusually large number of good illustrations. They assist the reader very materially in understanding the various steps of the operations described. The first 158 pages are devoted to the surgery of the nasal passages. A short chapter on the pharynx follows, given up mostly to the different operations on the tonsils. Then comes an instructive chapter on endolaryngeal operations with the aid of the laryngoscope, and finally the operations on the external ear and the surgery of the mastoid process. The book goes into the subject-matter direct, omitting much that might be included on pathology, etiology, etc., but which is really unnecessary in a work strictly on operative surgery.

Cataract, Senile, Traumatic and Congenital. By W. A. Fisher, M.D., Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College. Cloth. Price, $1.50. Pp. 119, with illustrations. Chicago: Chicago Eye, Ear, Nose and Throat College, 1917.

Had the title of this work been "Extracts from the Literature of the Smith-Indian Extraction of Senile Cataract," it would have conveyed a much truer idea of its contents. The whole subject of traumatic and congenital cataracts, their causation and treatment, is dismissed in ten pages; about five pages are devoted to other methods of removing senile cataract, while the remainder of the book, say, one hundred pages, consists mostly of previously published articles and chapters on the removal of cataract in its unruptured capsule, chiefly by Vail, Wright, Greene, Colonel Smith and the author. Long extracts from popular textbooks — de Schweinitz, Fuchs, Weeks, Swanzy — also take up a good deal of space. There are many rather poor electrotypes illustrating the book, some of which, especially of the author's modifications of the instruments or methods of others, are considered of such prime importance that they are repeated. For instance, identical cuts showing the "Smith-Fisher instrument" and the "author's lid hooks" are pictured on three separate occasions. The extraction of senile cataract in the unruptured capsule in properly selected cases, and in the hands of a trained operator and a trained assistant presents certain advantages over many forms of removal, but that it should be employed universally or to the exclusion of all other extraction methods (see page 99) is not yet established.

Anatomy and Histology of the Mouth and Teeth. By I. Norman Broomell, D.D.S., Professor of Dental Anatomy and Clinical Dentistry, Philadelphia Dental College, and Philipp Fischelis, M.D., Professor of Histology, Medico-Chirurgical College of Philadelphia. Fifth Edition. Cloth. Price, $3 net. Pp. 467, with 368 illustrations. Philadelphia: P. Blakiston's Son & Co., 1917.

This is practically a reprint of the previous edition, and is a combination of what might be better published as three separate books. It is subject to the criticism which may usually be applied to such efforts. It includes descriptive anatomy of the mouth and adjacent parts, the anatomy of the teeth and their supporting tissues, and the histology of these structures. In general, the book lacks the finer detail and thoroughness which a work on anatomy or histology should have. For example, in describing the cementum which forms the outer layer of the tooth root, it states that this tissue is similar to bone, but neglects to mention the very important difference that it has no circulation of blood, which is the thing of probably greatest importance for the dentist to know in considering the chronic infections involving this tissue. The statement is repeated in this edition that the enamel of the incisor teeth is formed from three points of beginning instead of four. The book states that the gingival portion of the gum tissue is of denser structure than those portions more distant from the teeth, but does not mention the differences in detail, such as the many long projecting legs of connective tissue which carry blood vessels far into the dense epithelium and provide for its rapid regeneration. Throughout, the book fails to have the vision of practical application which would make its use as a text more interesting to the student. There are many excellent illustrations. Among these the "in series" pictures of the roots of teeth in process of development give the best idea of any yet published of their form during growth.

Medicolegal

Representing to Judge that a Person Is Insane and Needs Hospital Treatment

(Reycraft vs. McDonald (Mich.), 160 N. W. R. 836)

The Supreme Court of Michigan affirms a judgment for the defendant, who was sued for slander because he made to the probate judge a statement to the effect that the plaintiff was insane and needed hospital treatment. The court says that the statement was made in the office of the judge of probate when only the defendant and the judge were present. It was clear from the record that it was for the purpose of instituting proceedings by which the plaintiff's alleged insanity should be judicially determined. On the information received by him at the time from the defendant, the judge prepared a proper petition for an order directing the admission of the plaintiff to an asylum or institution for the care of the insane, and the petition was signed and verified by the defendant. Notice of such petition, and of the time and place of the hearing thereon, was duly served on the plaintiff, who, with his attorney, thereupon appeared at the probate office for the purpose of the investigation. In the meantime it had been discovered by the judge that the defendant had no authority under the statute to make the petition, and he so announced to the plaintiff's attorney. The attorney replied that they would waive the question of jurisdiction and proceed with the merits of the matter; but it being the opinion of a physician, who had been consulted, that the plaintiff was not insane, the proceedings were dismissed. On behalf of the defendant it was claimed that the statement made to the probate judge regarding the plaintiff's insanity was absolutely privileged, because made in the course of judicial proceedings; but the plaintiff insisted that it was not made in the course of judicial proceedings, inasmuch as the defendant was not authorized to institute such proceedings, and his petition gave the court no jurisdiction over the person of the plaintiff. The supreme court agrees with the defendant's contention. It thinks his communication to the probate judge in this case was a matter of absolute privilege. It was made for the purpose of instituting legal proceedings, and to a court having jurisdiction of the subject-matter. Whether the defendant was authorized to make the petition, and whether it empowered the court to act in the particular case, were themselves questions for judicial determination.

Employment of Physician by Claim Agent or Subordinate Employee of Railroad

(Scullin et al. vs. Routh (Ark.), 191 S. W. R. 218)

The Supreme Court of Arkansas affirms a judgment for $210 in favor of plaintiff Routh against the defendants, as receivers of a railroad company, for medical services rendered to a man who sustained a double compound fracture of the leg in a wreck on the railroad. The court says that the general claim agent of the company telephoned to the plaintiff to go and take charge of the man and take him to his home. The plaintiff did so, and charged for the service $10. Septic infection set in, and it became necessary for some

one to continue to treat the man. The plaintiff made twenty-eight more visits to him, and charged therefor $7.50 a visit, which he said was a reasonable price, the place at which the patient was being about 9 miles away. The plaintiff stated that the general claim agent and his assistant both knew that he was continuing to treat the man, and directed him to do so. The claim agent admitted that he called the plaintiff to take charge of the man after he had been injured in the wreck, and also admitted that he knew that the plaintiff had continued to treat him and that it was necessary for some physician to treat him, but he said he had no authority to employ a physician except in cases of emergency. The railroad company introduced its rules in regard to the employment of physicians, which stated that the company would not recognize any responsibility for medical and surgical attention, etc., except such as contracted for by its general manager or superintendent. When persons or employees were injured, the nearest company surgeon should be called. If the case was urgent, and the company surgeon could not be immediately procured, the conductor, agent or officer in charge, if unable to procure instructions from the proper authority, was authorized to call the nearest surgeon available to administer first aid and care to the patient until the company surgeon could take charge of the case. This court has adopted the rule that subordinate employees of a railroad company, who under ordinary circumstances have no authority to bind the railroad company by contracts for medical attendance on its servants or passengers, have an implied authority to make such contracts in its behalf in cases in which there is an urgent necessity for the immediate employment of a physician or surgeon to attend to servants or passengers who have been injured by conditions or occurrences incident to the operation of a railroad. The urgency and necessity of the employment of the plaintiff by the claim agent who was in charge at the scene of the accident was submitted to the jury under proper instructions, but counsel for the defendants contended that under the rule announced in the decisions of this court as above, the liability of the railroad arises with the emergency and with it expires. They contended that the emergency ceased before the plaintiff rendered all the services for which he obtained judgment, and that on this account the verdict was without evidence to support it. But the court does not think that the doctrine of implied authority in such cases had any application to the facts of this case; for under the rules the claim agent had express authority to employ a physician within certain limitations. There was sufficient evidence to warrant the jury in finding that when the wreck occurred the general claim agent took charge and was unable to secure a surgeon of the company, and that he called in the plaintiff to take charge of the case. It was true that on cross-examination the plaintiff admitted that the company had a local physician near where the injured man resided, but it was not shown that this physician or any other physician of the company was in a position to take charge of the man. This was a matter peculiarly within the knowledge of the company. Its officers knew at what time one of its surgeons could take charge of the case, and the burden of proof was on the defendants to establish that fact. They did not do so, and there was nothing in the record tending to show that a surgeon of the company could have taken charge of the case at any time while the services were rendered by the plaintiff. The verdict for the plaintiff was sustained by the evidence.

Society Proceedings

COMING MEETINGS

Am. Assn. Obstetricians and Gynecologists, Newark, N. J., Sept. 17-19.
American Electro-Therapeutic Association, Atlantic City, Sept. 11-13.
American Roentgen Ray Society, Pittsburgh, Sept. 19-22.
Colorado State Medical Society, Colorado Springs, Sept. 25-27.
Indiana State Medical Association, Evansville, Sept. 26-28.
Michigan State Medical Society, Battle Creek, Sept. 4-6.
Missouri Valley Medical Society, Lincoln, Neb., Sept. 20-21.
Pennsylvania State Medical Society, Pittsburgh, Sept. 24-27.
Utah State Medical Association, Salt Lake City, Sept. 12-13.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Roentgenology, New York

July, IV, No. 7

1 Roentgen Diagnosis of Pathologic Gallbladder. A. W. George and R. D. Leonard, Boston.—p. 321.
2 Development of Roentgenology. H. C. Snook, Chicago.—p. 337.
3 Localization of Foreign Bodies. W. A. Wilkins, Montreal, Canada.—p. 343.
4 Sutton Method of Foreign Body Localization. E. H. Skinner, Kansas City, Mo.—p. 350.
5 Dangers in Roentgen Laboratory. J. S. Shearer, Ithaca.—p. 357.

Archives of Pediatrics, New York

June, XXXIV, No. 6

6 Early Recognition of Poliomyelitis. R. S. Haynes, New York.—p. 401.
7 Cerebrospinal Fluid in Acute Anterior Poliomyelitis with Special Reference to Diagnosis. J. A. Kolmer, Philadelphia.—p. 413.

Boston Medical and Surgical Journal

July 26, CLXXVII, No. 4

8 Some Medical Practice among New England Indians and Early Settlers. C. M. Cobb, Lynn.—p. 97.
9 Biologic Analysis in Study of True Epilepsy. F. L. Dunham, Baltimore.—p. 105.
10 Surgical Treatment of Laryngeal Cancer. J. E. Mackenty, New York.—p. 110.
11 *Mastiche and Potassium Permanganate Tests Applied to Cerebrospinal Fluid of Insane. L. G. Lowrey, Boston.—p. 115.
12 Case of Fracture of Cuboid Bone. W. P. Coues, Boston.—p. 117.
13 Case of Henoch's Purpura. E. D. Gardner, New Bedford.—p. 118.

11. Mastiche and Potassium Permanganate Tests Applied to Fluid of Insane.—From data presented by Lowrey dealing with the mastiche test on thirty-six fluids, and the permanganate test on twenty fluids from insane persons, the conclusion is drawn that neither of these tests is of sufficient value to become a part of the routine examination of spinal fluids from the insane.

Colorado Medicine, Denver

July, XIV, No. 7

14 Tumors of Breast. P. Hillkowitz, Denver.—p. 180.
15 Pulpless Teeth. I. C. Brownlie, Denver.—p. 183.
16 Dysmenorrhea. L. J. Weldon, Denver.—p. 189.
17 Transillumination of Larynx and Upper Trachea. F. R. Spencer, Boulder.—p. 193.
18 Diseases of Eye Resulting from Lesions of Mouth and Throat. J. A. Patterson, Colorado Springs.—p. 197.

Florida Medical Association Journal, Jacksonville

July, IV, No. 1

19 Presence of Tubercle Bacilli in Specimens of Feces Examined for Animal Parasites. H. H. Fox, Tallahassee.—p. 1.
20 Responsibility of General Practitioner to Mental Defective. G. B. Coon, Tampa.—p. 3.
21 Venereal Disease Problem. E. G. Birge, Jacksonville.—p. 10.
22 Value of Fresh Cow's Milk in Infant Feeding Compared with Artificial and Pasteurized Milk. J. G. DuPuis, Lemon City.—p. 14.
23 Abdominal Pregnancy. G. R. Holden, Jacksonville.—p. 16.
24 Neglect of Massage Reason Osteopaths and Chiropractors Exist. F. J. Walter, Daytona.—p. 19.

Georgia Medical Association Journal, Augusta

July, VII, No. 3

25 Classification of Mental Disorders Adopted by Georgia State Sanitarium. E. M. Green, Milledgeville.—p. 41.
26 *Endothelioma of Kidney; Report of Three Cases. J. Funke, Atlanta.—p. 47.
27 Treatment of Nausea of Pregnancy. S. T. Barnett, Atlanta.—p. 51.
28 Patent Medicine and Quacks. J. O. Elrod, Forsyth.—p. 54.

26. Endothelioma of Kidney.—Funke's first patient was a male, aged 43 years. Two years before the fatal issue he began to experience discomfort in the region of the kidney; he underwent repeated examination, but no definite conclusion could be reached as to the nature of the trouble. About one and one-half years before his death there appeared in the urine a few red blood cells, and about one month later the left kidney appeared to be slightly enlarged. Succeeding

examination revealed an increase in the size of the left kidney and constant presence of blood in the urine. About one month before death, the urine contained spherical cells, ranging from 20 to 30 microns in diameter, the protoplasm of which contained highly refractile bodies not unlike fat globules. The nucleus could not be seen. The necropsy showed a mass occupying the position of the left kidney measuring 13 by 42 by 12 cm., and weighing 900 gm. The lower half of the right kidney contained a circumscribed, well defined nodular mass measuring 2.5 cm. Histologically, the diagnosis was endothelioma of the left kidney, with metastasis to the opposite kidney and peribronchial lymph nodes. The second patient was a girl, 2 years of age. There was no history of a preexisting disease which was in any way related to the present condition. About six months previous the parents noticed that something inconvenienced the child, and that the disease seemed to be on the left side. In a very short time the patient complained of great discomfort, there was a bulging in the region of the left kidney. Urine showed nothing abnormal. A diagnosis of sarcoma was made. The mass was removed at operation and was found to be a part of the kidney. It proved to be an endothelioma of the kidney. The third patient was a man, 54 years of age. His trouble began about one and one-half years before death, and consisted of discomfort in the region of the left kidney. For more than six months before the operation the urine contained blood, never large in quantity. Enlargement of the kidney could not be determined. The left kidney was removed. The patient died four days later. The histology of this growth was like that of the other two cases.

Illinois Medical Journal, Chicago

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29 Injuries of Head, with Special Reference to Intracranial Complications. T. A. Davis, Chicago.—p. 1.
30 Lower Abdominal Incision. H. T. Byford, Chicago.—p. 10.
31 Diabetes: Initial Fast and Tolerance Testing. E. J. Brown, Decatur.—p. 12.
32 Splenectomy for Hemolytic Icterus. C. A. Elliott, Chicago.—p. 18.
33 Tonsil as Portal of Entry in Tuberculosis of Cervical Glands. W. B. Metcalf, Chicago.—p. 19.
34 State Hospital—Its Purposes, Limitations and Handicaps. W. M. Hotchkiss, Jamestown, N. D.—p. 23.
35 Incipient Psychoses. G. H. Moody, San Antonio, Texas.—p. 27.
36 Care of Newborn. T. Warloe, Chicago.—p. 28.

Indiana State Medical Association Journal, Fort Wayne

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37 Factors which Contribute to Safety and Success in Surgical Procedures. J. C. Fleming, Elkhart.—p. 269.
38 Evolution of the Beasley Splint for Femur. G. F. Beasley, Lafayette.—p. 276.
39 Working Knowledge of Ophthalmology and Otolaryngology for General Physician. G. W. Spohn, Elkhart.—p. 286.

Iowa State Medical Society Journal, Des Moines

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40 Wrist Injuries Frequently Overlooked. H. L. Beye, Iowa City.—p. 239.
41 Fractional Gastric Analysis. M. Mallory and L. K. Meredith, Des Moines.—p. 242.
42 Blood Chemical Analyses in Reference to Diagnosis and Treatment. R. B. H. Gradwohl, St. Louis.—p. 244.
43 Vasomotor Epilepsy or Vasoconstrictor Anaphylaxis. J. J. Rowan, Jr., Dubuque.—p. 248.
44 Duty of Medical Man in Present Crisis. J. C. Bloodgood, Baltimore.—p. 254.
45 Radium Therapy. D. P. Johnson, Muscatine.—p. 255.

Journal of Medical Research, Boston

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46 *Studies on Circulation of Kidney in Relation to Architecture and Function of Organ in Health and Disease. L. Gross, Montreal, Canada.—p. 327.
47 *New Pathogenic Sporotrichum. Found in Case of Acute Arthritis of Knee Following Injury (Sporotrichum Councilmani). S. B. Wolbach, W. R. Sisson and F. C. Meier, Boston.—p. 337.
48 Part Played by Protein-Free Digestion Products and by Meat Infusion in Diphtheria Toxin Production. H. C. Robinson and L. F. Rettger, New Haven, Conn.—p. 357.
49 *Physiologic Significance of Anatomic Changes Produced in Nerve Cells by Toxin of B. Diphtheriae. R. R. Simmons, St. Louis.—p. 377.
50 *Spleen as Bacterial Filter. Y. Ozaki, New Haven, Conn.—p. 413.
51 *Treatment of Patients with Bronchial Asthma with Subcutaneous Injections of Proteins to which They are Sensitive. I. C. Walker, Boston.—p. 423.
52 Study of Micro-Organisms of Dental Caries. P. R. Howe and R. E. Hatch.—p. 481.
53 *Studies in Calcification by Use of Vital Dyes. C. C. Macklin, Baltimore.—p. 493.
54 Studies on Paratyphoid-Enteritidis Group. Differentiation of Members of Paratyphoid Enteritidis Group from B. Typhosus. C. Krumwiede, Jr., and L. A. Kohn, New York.—p. 509.
55 Selective Medium for Isolation of B. Pestis from Contaminated Plague Lesions and Observations on Growth of B. Pestis on Autoclaved Nutrient Agar. J. G. Drennan and O. Teague, Rosebank, N. Y.—p. 519.

46. **Circulation of Kidney.**—By means of barium sulphate injections and roentgenograms, Gross studied the architecture of the blood vessels of the kidney. The results obtained indicate that this method of demonstrating the circulation is applicable to most organs, and that it furnishes a more reliable, rapid, complete and truthful picture than can be obtained by other methods so far in use. So far as the kidney is concerned, the older conceptions which are still found in anatomic and histologic textbooks were shown to be wrong. The roentgenograms will show that there are no divisions of the renal artery which could possibly correspond to the so-called arcuate arteries, and that, instead, the renal arterial architecture resolves itself into a simple tree-like dichotomous arrangement of the branches of the principal afferent artery. These, it is true, run between the pyramids and cortical substance; also they break up rather acutely into their branches, undoubtedly by this means transmitting directly the high aortic pressure. A remarkable point is the very abrupt and complete breaking up of the large arteries, as they approach the cortex, into numerous very small straight branches which permeate the latter. This abrupt breaking up of comparatively large arteries into very small ones (endarteries) undoubtedly gives rise again to a relatively tremendously high pressure in the latter. In view of the totally different conception which these reconstructions give of the architecture of the renal blood vasculature, a different terminology is suggested. The first large branches of the renal artery coursing between the pyramidal and cortical substance, Gross would call interlobar arteries—the very numerous small endarteries which run perpendicularly throughout the cortex, intralobular arteries—and the small branches which come off at right angles to the latter and run to the glomeruli, glomerular arteries.

47. **Pathogenic Sporotrichum Found in Acute Arthritis.**—From a case of traumatic arthritis (nail puncture) of the knee, the authors isolated a new sporotrichum for which the name *Sporotrichum councilmani* is proposed. The important distinguishing features of *Sporotrichum councilmani* are: (1) its pleomorphic growth, characterized by a free aerial growth of hyphae; (2) the abundant spore formation, large size of the spores and absence of lateral spore clusters and (3) the occurrence in lesions as septate branching filaments.

49. **Anatomic Changes Produced in Nerve Cells.**—The changes produced by diphtheria toxin, Simmons says, are essentially, if not solely, those of pure functional depression. The degree of depression produced by lethal doses of the toxin depends on the time afforded for the action of the toxin after inoculation. Temporary cessation of function may result from profound depression, or, if the process goes on to necrosis, the damage is permanent. Clinical evidence is not lacking to prove that in some cases the damage done is irreparable and the paralysis permanent, while in other cases it is temporary and the cells ultimately return to normal or nearly normal function.

50. **Spleen as Bacterial Filter.**—Ozaki found that the accumulation of bacteria in the spleen, such as occurs in experimental bacteremia, is principally dependent on the vital activity of the cells, and the mechanical filtration of bacteria by the spleen is not an important factor in their detention.

51. **Treatment of Bronchial Asthma.**—This paper is based on the study and treatment of forty patients with bronchial asthma, all of whom were sensitive to some type of protein derived from bacteria, food, or animal hair. Bronchial asthmatics who are sensitive to proteins found in horse

dandruff and in cat hair were relieved of attacks during a series of subcutaneous injections with these proteins. Some cases have remained free from asthma as long as five and six months while treatment was continued. Bronchial asthmatics who are sensitive to the proteins in *S. pyogenes-aureus* and *albus* were relieved of attacks during treatment with vaccines of these organisms, and in the case of the former relief continues for four to six months after the vaccines are discontinued, but with the albus vaccines relief continues for a shorter time after they are discontinued. A second course of vaccines relieves a relapse of asthma quicker than did the first course. Bronchial asthmatics who are sensitive to the food proteins were relieved of attacks, and they remain free from asthma while such proteins are omitted from their diet. Patients with bronchial asthma associate attacks with cold air, dampness, changeable weather, winds, menstruation, indigestion, nervousness, irritability, colds and bronchitis. After-treatment with proper proteins these patients become tolerant to such conditions, so that they can be exposed to them without asthma and they become free from nervousness, irritability and indigestion without the use of drugs and hygienic measures. There seems to be two types of colds and bronchitis, one type is anaphylactic, and relief or freedom from this type follows proper treatment with proteins, the other type seems to be caused by bacteria and frequently vaccine relieves and prevents these.

53. **Studies in Calcification.**—The results of Macklin's investigations showed that nonosseous calcareous deposits, such as calcific granules in the permanently ligated kidney and in the lens in cataract, are distinctly and specifically stained by feeding madder. When the dyestuff was fed during only a part of the period when the concretion was forming the stain is found only in parts of the concretion, and these stained areas probably represent the masses which were deposited during the time that the dyestuff was being fed. In these respects, and in the fact that the intensity of staining differs in different areas in direct proportion to the extent of the deposition, during the period of madder feeding, of calcium salts, the phenomenon is analogous to that which obtains in developing bone of the madder fed animal. Thus the conception of a closely similar or identical physicochemical process in the formation of developing bone and of pathologic calcific deposits is strengthened. Not only is calcified cartilage formed in the development of "cartilage bone," vitally stained by madder feeding, but the portions of any cartilage which contain salts of calcium are vitally stained with the dyes of madder if feeding is prolonged. This staining was found in rats fed continuously for three months or longer.

Journal of Urology, Baltimore

June, I, No. 3

56 *Ratio Between Urea Content of Urine and of Blood After Administration of Large Quantities of Urea. T. Addis, San Francisco. —p. 263.
57 *Operative Treatment of Urethrorectal Fistula. Presentation of Method of Radical Cure. H. H. Young and H. B. Stone, Baltimore.—p. 289.
58 Use of Tests of Renal Function in Cases of Nephritis. H. A. Christian, Boston.—p. 319.

56. **Ratio between Urea in Urine and Blood.**—The ratio between the urea content of the urine and of the blood expresses the number of times by which the urea excreted in the urine during a certain period of time exceeds the amount of urea present in 100 c.c. of the blood supplied to the kidney during this time. It is the relation between the amount of work accomplished by the kidney, and the most important measure of the amount of work the kidney is called on to perform. Differences in the concentration of urea in the urine are not the cause of this variability in the ratio over short periods of time. Evidence is given against the supposition that this variability arises from such alterations in the amounts of urea or of oxygen brought to the kidney as would be produced by differences in the rate of flow of blood through the kidney. The magnitude of the ratio increases with increase in the blood urea concentration. In other words, the kidney responds to a call for more work by an increase in output which is greater than the increase in demand. A direct relationship exists between the magnitude of the ratio and the size of the kidneys. The removal of one kidney leads to a depression of the ratio. In kidneys whose effective size has been reduced by necrosis or degeneration of varying extent, there is a relation between the degree of depression in the ratio and the amount of tissue which has been rendered functionless.

57. **Operative Treatment of Urethrorectal Fistula.**—The operation described by Young and Stone is performed as follows: First, suprapubic drainage of the bladder is established, with the patient in dorsal posture. The patient is then shifted to the exaggerated lithotomy position. A racquet-shaped incision, begining in the midline of the perineum about 3 cm. anterior to the anal margin, is carried backward to this margin, and then encircles it at the mucocutaneous juncture. Through the circular part of this incision the mucosa of the rectum is dissected free all around until a cylinder of the membrane is stripped from its attachments well above the point at which the rectal orifice of the fistula opens, the fistulous tract, of course, being divided transversely in this process. This ascending dissection of the bowel is carried upward until sufficient mucous membrane is loosened to permit the pulling of the segment containing the fistulous orifice well out of the anus, the orifice and a small margin of normal mucosa above it, and all that below it, lying outside the skin level and later being excised. Next, the structures of the perineal body are divided through the straight incision in the midline—the handle of the racquet—so as to expose thoroughly the urethral orifice of the fistula.

The edges of the urethral fistulous opening are freshened, and brought together with catgut sutures over a sound previously passed through the urethra. These sutures do not penetrate the surface of the urethral mucous membrane. The levatores, fascia, and smaller muscles are then brought together by interrupted catgut sutures across the midline of the perineum in several layers, reconstructing the perineal body much as is done in gynecologic operations for relaxed vaginal outlet. Finally, the sphincter ani is restored by uniting its ends with a mattress suture of catgut, and the midline incision is closed with interrupted sutures. The last stage in the operation consists in the excision of the protruding cuff of rectal mucosa in which the fistulous opening lies, and the union of the lower end of the rectal tube to the anal skin margin by interrupted silk sutures after four submucous-subcutaneous sutures of catgut have been placed at quadrant points to help anchor the bowel in place.

Kentucky Medical Journal, Bowling Green

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59 Recruiting for the Military Service. F. T. Woodbury.—p. 307.
60 Unusual Injuries Treated under Adverse Circumstances. O. B. Demaree, Mt. Sterling.—p. 317.
61 Railway Surgeon and His Work. L. M. Scott, Jellico, Tenn.—p. 319.
62 Neuroses Following Railroad Injuries. H. B. Scott, Louisville. —p. 322.
63 Gunshot Wounds. W. Bach, Jackson.—p. 323.
64 Sprains and Their Treatment. C. Austin, Bagdad.—p. 325.
65 Fractured Skull. J. W. Parker, Corbin.—p. 326.
66 Illustrating Some Possibilities of Antiseptic Surgery. D. G. Simmons, Adairville.—p. 327.
67 Railway Surgeon as an Expert Witness. A. R. Burnam, Jr., Richmond.—p. 328.
68 Blood Pressure. W. A. Jenkins, Louisville.—p. 330.
69 Laboratory as Aid in Diagnosis of Mastoiditis and Its Complications. W. B. Doherty, Louisville.—p. 334.
70 Therapeutics of Organic Heart Diseases. E. A. Cram, Butler. —p. 340.
71 Burns and Their Treatment. A. H. Barkley, Lexington.—p. 341.
72 Diabetes Mellitus. J. J. Molloy, Covington.—p. 344.
73 Pericarditis. W. Byrne, Sr., Russellville.—p. 346.
74 Efficacy of Drugs. W. J. Gerding, Newport.—p. 348.

Laryngoscope, St. Louis

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75 Technic of Suspension in Bronchoscopy and Esophagoscopy. R. C. Lynch, New Orleans.—p. 533.
76 Primary Carcinoma of Middle Ear; Report of Case. H. Newhart, Minneapolis.—p. 543.
77 New Instrument and Technic for Enucleation of Tonsil. J. Braun, New York.—p. 556.
78 Headache; Its Otorhinologic Aspects. W. T. Patton, New Orleans. —p. 564.

79 Lateral Sinus Thrombosis with Spontaneous Rupture of Sinus. A. C. Lewis, Memphis, Tenn.—p. 569.
80 Adhesions of Soft Palate to Posterior Pharyngeal Wall; Successful Silver Plate Method of Treatment. F. Hazlehurst, Baltimore.—p. 574.
81 Interesting Cut Throat Case. W. W. Carter, New York.—p. 578.
82 Case of Staphylococcemia. W. W. Carter, New York.—p. 579.

Medical Record, New York

July 21, XCII, No. 3

83 Histopathology of Human and Experimental Poliomyelitis. G. B. Hassin, Chicago.—p. 89.
84 Effects of Civilization on Morbidity and Mortality of Tuberculosis. S. A. Knopf, New York.—p. 94.
85 Nonspecific Protein Treatment of Inoperable Cancer. S. P. Beebe and H. S. Williams, New York.—p. 98.
86 Alcoholism in Relation to Epileptoid States and Epilepsy. A. Gordon, Philadelphia.—p. 100.
87 Medicolegal Aspects of Radium Therapy. J. B. Bissell, New York. —p. 102.
88 Gas Bacillus Infection in Chronic Mastoiditis with Cholesteatoma; Operation, Recovery. W. W. Carter, New York.—p. 104.

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89 Poliomyelitis. A. H. Doty, New York.—p. 135.
90 Civilization and Children's Diseases. R. G. Freeman, New York. —p. 136.
91 Civilization and Diseases of Adult Life. E. O. Otis, Boston.—p. 138.
92 Civilization and Diseases of Middle Life. H. Brooks, New York. —p. 140.
93 Early Diagnosis of Tuberculosis. M. E. Lapham, Highlands, N. C. —p. 143.
94 Relative Value of Massage, Exercises, and Baths in Treatment of Affections of Heart. D. Graham, Boston.—p. 148.
95 Instruments of Precision for Percy Treatment of Uterine and Other Cancer. Electropyrometric Heater. Distensible Hydrothermotaxic Heater. A. E. Gallant, L. H. Moss, New York; L. Bliss, Washington, D. C., and E. N. Lightfoot, New York. —p. 151.
96 Trench Fever. B. Sherwood-Dunn, Paris.—p. 155.

Medicine and Surgery, St. Louis

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97 Looking Backward. W. G. Morgan, Washington.—p. 449.
98 Treatment of Chronic Protozoic Enterocolitis as Encountered in Northern United States. F. Smithies, Chicago.—p. 460.
99 Differential Diagnosis of Atrophic Hepatic Cirrhosis and Gastric Cancer, without Palpable Tumor. A. E. Austin, Boston.—p. 468.
100 Three Cases of Colon Infection. J. Sailer, Philadelphia.—p. 473.
101 Roentgen Rays in Diagnosis of Intestinal Stasis. G. E. Pfahler, Philadelphia.—p. 478.
102 Syphilis of Stomach; Report of Cases. A. L. Levin, New Orleans. —p. 498.
103 Silent Common-Dust Stone. D. N. Eisendrath, Chicago.—p. 507.
104 Chronic Hemolytic Icterus; Report of Two Cases Treated by Splenectomy. J. W. Larimore, St. Louis.—p. 513.
105 Stomach Disturbance without Stomach Disease; Report of Cases. M. L. Harris, Chicago.—p. 524.
106 Relation of Bacteriuria and Pyuria to Intestinal Disturbances in Children. F. C. Neff, Kansas City.—p. 536.
107 Pyloric Obstruction in Infancy. E. H. Schorer, Kansas City. —p. 541.

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108 True Physician a Moral Force. J. F. Welch, Salisbury.—p. 273.
109 Intra-Ocular Tuberculosis and Associated Inflammatory Lesions of Upper Respiratory Tract. F. O. Schwartz and M. M. Meyers, St. Louis.—p. 276.
110 Complement Fixation Test for Tuberculosis and Wassermann Test in Pulmonary Tuberculosis. G. Ives, and J. J. Singer, St. Louis. —p. 284.
111 Prevention of Venereal Diseases. H. E. Kleinschmidt, St. Louis. —p. 288.
112 Drug Intoxication. H. C. Park, Knobnoster.—p. 292.

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113 Henry W. Putnam Memorial Hospital, Bennington, Vt. H. L. Walker and S. S. Goldwater, New York.—p. 1.
114 Institutional Care of Aged. I. L. Nascher, New York.—p. 4.
115 Economy in Cutting of Surgical Dressings. C. C. McGrath, Detroit.—p. 8.
116 Institutional Life of Moron. R. P. C. Wilson, Marshall.—p. 9.
117 Institutional Care of Epileptics. W. T. Shanahan, Sonyea, N. Y. —p. 10.
118 State Care for Feebleminded. J. M. Murdoch, Polk, Pa.—p. 12.
119 Sonoma State Home for Feebleminded and Epileptics. W. J. G. Dawson, Eldridge, Cal.—p. 14.
120 Flavoring Extracts, Their Character and Composition. J. P. Street, New Haven, Conn.—p. 15.
121 Standardization of Hospitals—University or Teaching Hospital. J. A. Hornsby and others, Chicago.—p. 18.

New Jersey Medical Society Journal, Orange

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122 Social Insurance. P. Marvel, Atlantic City.—p. 257.
123 Surgical Treatment of Joints. G. H. Sexsmith, Bayonne.—p. 262.
124 Uterine Curet in Treatment of Septic Abortions and Puerperal Infections. J. M. Fisher, Philadelphia.—p. 265.
125 Historical Evidence of Origin of Syphilis. J. H. Rosenkrans, Hoboken.—p. 268.
126 Treatment of Complicated Gonorrhea in Male with Special Reference to Local Action of Drugs. N. Ramos, Newark.—p. 271.
127 Ideals of Medicine. W. P. Eagleton, Newark.—p. 273.
128 Idealism in Medicine. H. C. Bleyle, Newark.—p. 274.
129 Review of Fifty Years' Practice of Medicine. G. R. Kent, Newark.—p. 277.

New York Medical Journal

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130 Medical Service in British Army. T. H. Goodwin.—p. 101.
131 Psychopathology of Prostitution. M. J. Karpas, New York. —p. 103.
132 Value of Sputum Cultures in Diagnosis of Pulmonary Tuberculosis. J. A. Roddy and D. R. Brewer, Philadelphia.—p. 108.
133 Human Anthrax; Report of Case. J. B. Bissell, New York. —p. 110.
134 Clinical Significance of Fecal Analysis. L. W. Kohn, Philadelphia. —p. 111.
135 Intravenous Use of Calcium Solutions as Aid in Treatment of Tuberculosis. T. J. Beasley, Indianapolis.—p. 116.
136 Acute Appendicitis. A. Nicoll, New York.—p. 117.
137 Treatment of Locomotor Ataxia by Maloney Method. H. F. Wolf, New York.—p. 121.

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138 Control of Uterine Hemorrhage. A. B. Davis, New York.—p. 149.
139 Race Betterment Based on Principles of Physical and Mental Prophylaxis. A. Gordon, Philadelphia.—p. 153.
140 Simple Aspirating Device. A. L. Benedict, Buffalo.—p. 156.
141 Cause and Management of Puerperal Eclampsia. R. S. Hill, Montgomery, Ala.—p. 157.
142 Acroparesthesia. H. Climenko and R. Bogan, New York.—p. 159.
143 Clinical Significance of Gastro-Intestinal Toxemias. E. E. Smith, New York.—p. 161.
144 Operative Treatment of Gunshot Fractures. J. R. Eastman, Indianapolis and R. B. Bettman, Chicago.—p. 164.
145 Bradford Frame in Treatment of Buttock and Hip Injuries of War. K. Speed, Chicago.—p. 168.
146 Creosote Carbonate and Quinin in Pneumonia. C. M. Nice, Birmingham, Ala.—p. 170.

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147 Important Medical Matters of Today. J. M. Semple, Spokane. —p. 191.
148 War Experiences in England and France. R. D. Forbes, Seattle. —p. 194. To be concluded.
149 Case of Unusual Idiosyncrasy to Quinin. R. W. Stearns, Medford, Ore.—p. 197.
150 Linitis Plastica. (Leather Bottle Stomach.) E. O. Houda, Tacoma.—p. 197.
151 Rectal Dam and Irrigator. S. D. Calonge, Salt Lake City.—p. 198.

Ophthalmic Record, Chicago

July, XXVI, No. 7

152 Diagnosis of Couched Cataract. R. H. Elliot, London, England. —p. 329.
153 Case of Pneumococcus Conjunctivitis of Great Chronicity and Subsequent Death from Pneumonia. C. A. Clapp, Baltimore. —p. 336.
154 Rare Intra-Ocular Tumor. H. R. Wright, Columbus.—p. 339.

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155 Removal of Foreign Bodies by Direct Bronchoscopy and Esophagoscopy. C. C. Eves, Philadelphia.—p. 687.
156 Mine Injuries to Eye as Related to Compensation Law. G. D. Murray, Scranton.—p. 695.
157 Disappointments Following Tonsillar Operations. B. C. Gile, Philadelphia.—p. 705.
158 Trachoma—Diagnostic Point and Method of Treatment. V. E. VanKirk, Pittsburgh.—p. 708.
159 What is Diagnosis? F. N. Emmert, Chambersburg.—p. 709.
160 *Diabetic Gangrene. J. H. Jopson and E. H. Goodman, Philadelphia.—p. 710.
161 *Present-Day Treatment of Tuberculous Abscesses and Sinuses. C. W. Delaney, Altoona.—p. 717.
162 Idiosyncrasies in Ectopic Pregnancy. W. A. Nason, Roaring Spring.—p. 719.
163 *Some Phases of Chronic Colitis. E. Zugsmith, Pittsburgh.—p. 721.
164 *Value of Roentgen Rays in Diagnosis of Pulmonary Tuberculosis. W. F. Manges, Philadelphia.—p. 725.

160. Abstracted in The Journal, Nov. 4, 1916, p. 1394.

161, 163 and 164. Abstracted in THE JOURNAL, Nov. 11, 1916, pp. 1471 and 1472.

Tennessee State Medical Association Journal, Nashville

July, X, No. 3

165 *Traumatic Hysteria. W. G. Somerville, Memphis.—p. 91.
166 Acidosis. J. B. McElroy, Memphis.—p. 94.
167 Case of Congenital Deformity of Leg, Toes and Fingers. A. G. Nichol and R. H. Perry, Nashville.—p. 99.
168 Interpretation of Bladder Disturbance in Female. V. D. Holloway, Knoxville.—p. 101.
169 Development of Medical Education and Its Effect on Profession. J. L. Miller, Nashville.—p. 104.
170 Transvesical Prostatectomy. G. R. Livermore, Memphis.—p. 109.
171 Pus in Peritoneal Cavity. A. B. Cooke, Los Angeles.—p. 114.

165. Abstracted in THE JOURNAL, April 28, 1917, p. 1286.

Texas State Journal of Medicine, Fort Worth

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172 Early Diagnosis of Exophthalmic Goiter. J. A. Witherspoon, Nashville, Tenn.—p. 109.
173 Simplicity and Rationalism vs. Complexity and Radicalism in Treatment of Purulent Dacryocystitis. W. R. Thompson, Fort Worth.—p. 111.
174 *Diagnosis of Functional Disease of Liver. H. L. McNeil, Galveston.—p. 114.
175 Pyorrhea Vital Factor in Insurance Examinations. J. L. Davis, Waco.—p. 118.
176 Collection of Vital Statistics in Smaller Cities. L. Kaffie, Corpus Christi.—p. 139.

174. **Diagnosis of Functional Disease of Liver.**—In a series of ninety-eight patients suffering from the greatest variety of diseases, including some twenty cases of disease of the liver, McNeil found seven patients with an increased amount of blood ammonia (considering as an increase any amount over 3 mg. per 100 c.c. of blood). One of these was a patient with eclampsia, whose liver at necropsy showed extensive degeneration. Another was a patient with syphilis of the liver in a fairly advanced stage; four cases were patients with long continued chronic passive congestion of the liver from chronic cardionephropathy, and one case was a chronic alcoholic suffering from the periodic and persistent vomiting referred to previously. In four of these cases acidosis was present, but in the three others including the last case no acidosis whatever was present. Twenty-four other cases of acidosis, many of the severest type, studied with this point in view, showed a uniform absence of appreciable increases of ammonia in the blood. Also five other cases of atrophic cirrhosis of the liver failed to show any increase in ammonia above 5 mg. per 100 c.c. of blood. As a result of these investigations, it would seem that acidosis, per se, does not cause any excessive increase of ammonia in the blood (over 3 mg. per 100 c.c.), but that such an increase is indicative of disturbance of the functional capacity of the liver.

Washington Medical Annals

July, XVI, No. 4

177 Achylia Gastrica; Diagnosis. J. R. Verbrycke, Jr., Washington, D. C.—p. 242.
178 Symptoms of Achylia Gastrica. W. E. Clark, Washington, D. C. —p. 244.
179 Anencephalic Fetus. H. C. Macatee, Washington, D. C.—p. 248.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

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35 *Early Treatment of Gunshot Injuries of Spinal Cord. H. M. W. Gray.—p. 44.

18. **Bronchoscopy in Treatment of Asthma.**—Syme has treated eight patients with asthma by the direct application of silver nitrate solution to the lining of the bronchi with the aid of the bronchoscope. The ages of the patients ranged from 10 to 53. The bronchoscope is introduced, and a mixture of cocain and epinephrin is applied to the mucous membrane in advance of the tube so far as the openings of the secondary bronchi. The entrance to the secondary bronchi and the main bronchi are then swabbed with a 10 per cent. solution of silver nitrate. Syme has been specially careful to apply the solution to the regions of the bifurcations, because it seemed that the mucous membrane at these places was hyperemic, and, at any rate, the air current impinges most strongly at these points, and the reflex is most active there. The idea underlying the treatment is that in asthma one factor in the causation is an exaggeration of a normal reflex. When an irritative substance, such as an irritating gas, touches the lining of the bronchi and larger branches, the smaller bronchi and bronchioles are by reflex action contracted for protective purposes. In attempting to weaken this reflex in asthma by applications to the peripheral pole, it is not implied that the hypersensitiveness is at that part. Probably it is, as has been previously observed, central in the main. Silver nitrate solution suggested itself because it is commonly used in irritative conditions of the higher parts of the respiratory apparatus, and because it leaves a coating of silver chlorid or albuminate, and so its action is prolonged. A fairly acute reaction follows the application, and the breathing is somewhat labored for a day or two, during which the patient is kept in bed.

19. **New Culture Medium for Gonococcus.**—The medium used by Thomson is made up as follows: 1. Prepare nutrient agar (2.5 per cent.) in the ordinary way with bouillon and Witte's peptone (1 per cent.), and render it + 6 acid. 2. Add all the salts natural to the human blood (as in Ringer's solution), namely, sodium chlorid, 9 gm.; calcium chlorid, 0.25 gm., and potassium chlorid, 0.42 gm. per liter. 3. Add

glucose 2.5 per cent. 4. The nutrient agar, with salts and glucose, is then tubed, about 4 c.c. being added to each test tube. 5. The sterile tubed agar is melted in boiling water, and after allowing it to cool to about 50 C., add 1 c.c. of human plasma to each tube and mix thoroughly by rolling the tube between the palms. Allow the medium to solidify in a sloping position. For plating, the contents of three tubes may be added to a Petri dish.

20. **Brilliant Green as Antiseptic.**—Webb dissolves the brilliant green in normal saline solution in the strength of 1 in 1,000. At this strength it can be used as a lotion, and gauze soaked in it can be applied to the wound as a dressing. It is nonirritating to the tissues. Webb has applied it to the peritoneum, the meninges, the synovial membranes, and practically all other varieties of tissue without harmful effects. The less vascular tissues are stained green by its use—for instance, the cuticle of the skin, the edges of fascia or aponeurosis, and sometimes bones. But where it has been in contact with the more vascular muscle or subcutaneous tissue, no staining occurs. Dead and necrosed portions of muscle are stained green, and this fact is sometimes of use in distinguishing such necrotic tissue. After being in contact with the tissue, the dye gradually becomes transformed into a leukoderivative, and the hitherto green-dyed gauze in contact with the wound becomes white to the depth of several layers. Granulation tissue rapidly forms in the wound. The most striking results are seen in the cut surfaces of muscle. Webb has also used the green in conjunction with "salt" tablets. It has given better results than the use of one or other alone. It can also be used after the method of Carrel — ½ ounce to 1 ounce of a 1 in 1,000 solution being syringed down a tube or series of tubes leading into the depths of the wound. It is not so irritant to the skin edges as the hypochlorite solution.

35. **Treatment of Gunshot Injuries of Spinal Cord.**—Three types of cases which arrive at a casualty clearing station showing paraplegia are considered by Gray — one in which the symptoms are due to local concussion, another in which the cord is organically severed, and a third in which paraplegia has developed since the injury. The paralyzing effects of local concussion are often very marked. This may be caused even by the flight of a missile close to but outside the spinal canal. In such cases the paralysis usually begins to clear up within a few days. If no sign of return of function occurs within nine or ten days, the question of operation for removal of blood clot or possible depressed bone, occurs, but must be decided at the base. If, on the other hand, a rifle bullet causing a through and through wound of the trunk traverses the spinal canal, the cord is usually hopelessly pulped. It is obvious that cases of complete sudden paraplegia should not be kept in the casualty clearing station if they are otherwise fit to travel. If, however, the paralysis has developed since the man was wounded, it is probably due to pressure from blood clot (when it is not likely to be absolute), or to displacement of fragments of bone during movement. In both these cases early operation may be indicated, but in the latter only if the Roentgen rays show a minor degree of displacement. If displacement is great, the cord is probably pulped.

If conduction, either motor or sensory, is present in the affected part of the cord when the patient is admitted to the casualty clearing station, it is usually found that fragments of bone are pressing on the cord, or that the missile causing the injury is in close relationship to it, and will probably have carried in sepsis. There may or may not be partial division of the cord. A missile with momentum sufficient to carry it far past the cord usually produces complete early paraplegia, even though it may not cause complete section. If, then, Roentgen rays reveal fracture or the presence of a foreign body partly or wholly in the spinal canal, operation should be performed at once, with the quadruple purpose of relieving pressure, cleansing the wound, restoring normal circulation as soon as possible, and thus of combating sepsis. In some cases pain is so excessive and uncontrollable by other means, that, whatever the amount of paralysis, operation is imperative in order to relieve the pain.

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36 Technic of Splenectomy. C. J. Smith.—p. 8.
37 Acute Otitis Media with Paralysis of Sixth Nerve (Gradenigo Symptom-Complex). D. Guthrie.—p. 15.
38 Clinical Symptoms and Treatment of Hypertrophy of Thymus Gland. C. G. Cumston.—p. 20.
39 *Case of Myxosarcoma of Soft Palate. D. M. Greig.—p. 24.

39. **Myxosarcoma of Soft Palate.**—A boy, 13 years of age, was referred to Greig on account of a growth on the palate of between three and four years' duration. He had no illness previous to nearly four years ago, when it was noticed that he was speaking somewhat thickly, and on examination a small growth was observed depending from the soft palate. This was removed by a surgeon under local anesthesia. The growth recurred, however, shortly afterward, and a year after the first operation it was more thoroughly removed by another surgeon, and the base of the tumor frequently cauterized thereafter. Some twenty applications of the actual cautery were made and from time to time sloughs separated, but the treatment lapsed and again the growth gained ground. The entire soft palate, the uvula, and the posterior half of the hard palate were hidden by a flattened, papillomatous-looking growth split up into many lobules and obviously attached by a broad base. There was no induration, the general surface of the tumor was smooth, no individual lobule projecting. The right tonsil seemed fuller than natural. There was no nasal obstruction, and no enlarged glands to be felt about the neck. An incision was made through the whole thickness of the soft palate at its junction with the hard palate, and was prolonged laterally backward to include the anterior pillars of the fauces, and the right tonsil was at the same time enucleated. The boy remained free of any trouble for nine months, when Greig found a small recurrence on the right side on the mucous membrane in front of the site of the enucleated right tonsil. This small recurrence was freely excised, and he has had no trouble since.

Journal of Laryngology, Rhinology and Otology, London

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40 War Injuries and Neuroses of Otologic Interest . H. J. Marriage.—p. 177.
41 Cranial Osteomyelitis Following Intranasal Operation for Chronic Frontal Sinusitis. N. Maclay.—p. 186.
42 Acute Middle Ear Suppuration, Mastoid Empyema, Sinus Thrombosis, Purulent Leptomeningitis, Cerebellar Abscess, Operations, Death. W. S. Syme.—p. 190.

Journal of Tropical Medicine and Hygiene, London

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43 Case of Urinary Amebiasis with Cystitis. E. J. Wright.—p. 145.
44 Espundia (Naso-Oral Leishmaniasis) in Anglo-Egyptian Sudan. B. J. Susu.—p. 146.

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47 *Treatment of Wounds of Knee Joint. T. S. Novis.—p. 12.
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52 *Marching Fractures; Report of Six Cases. A. H. Pirie.—p. 47.
53 Universal Extension Splint for Gunshot Fractures of Upper Limb. R. Williams.—p. 48.
54 Treatment of Recent Gunshot Wounds with Bismuth-Iodoform-Paraffin Paste. L. Colledge and H. Drummond.—p. 49.
55 *Hemoglobin Value of Blood in Surgical Shock. F. A. Bainbridge and H. B. Bullen.—p. 51.
56 Device for Insuring Spontaneous Separation of Blood Clot from Walls of Containing Vessel. A. D. Gardner.—p. 51.
57 Sebaceous Horn. O. Vevers.—p. 53.

46. **Skin Grafting.**—The authors have revived the use of Steele's grafts and introduced certain new features into both the grafting operation and the after-treatment, which aim at making the transplantation of skin a simple, reliable pro-

cedure. With respect to the grafting operation, the chief new, or at least unusual, features are: (1) the use of local anesthesia induced by nerve blocking; (2) the suture of each of the raw surfaces left after removal of the grafts. With regard to after-treatment the authors have been influenced by the recognition of the important part played by the tryptic action of pus; in consequence the after-treatment advocated has aimed especially at preventing the accumulation of pus, while avoiding at the same time any movement of the grafts. The means employed to achieve this were the use of a material to hold the grafts in position and allow the escape of any discharge from the wound; at the same time it permits the surface to be efficiently cleansed at frequent intervals. This material consists of an oiled fabric suitably perforated; it is strong, durable, and can be boiled; it is sufficiently supple to follow the irregularities of the wound, adheres lightly to the surrounding normal skin, but hardly at all to the granulations or the grafts. When a layer of this material is placed between the grafted surface and the outer dressings, it has proved perfectly feasible and safe to change the latter every day following the operation, provided these dressings have kept moist. Except in the case of the few wounds which have practically no discharge, such a daily change of dressing is not only advisable but indispensable for successful grafting. Locke's solution, as representing most nearly the blood fluids, is used for cleansing the wound both at the time of operation and also at the daily dressings.

47. **Treatment of Wounds of Knee Joint.**—Novis emphasizes the necessity for free drainage of the posterior pouches. He says that if this is done at a reasonably early stage the large majority of cases will recover with a useful limb and many with a fair range of movement. Complete ankylosis will by no means necessarily follow. A free incision is made into the subcrureus bursa and into the lateral pouch on either side of the patella and drainage tubes of moderate size inserted into the joint. The patient is then turned on his face, an incision made on either side between the hamstring and the gastrocnemius, and the ligament of Winslow freely incised longitudinally over either condyle of the femur. In making the external incision care must be taken to avoid the external popliteal nerve which should be drawn inward with the gastrocnemius. In cases in which suppuration is prolonged, difficulty may be experienced in keeping open the posterior incisions, but in these cases good drainage can be obtained by making a communication between the posterior pouches in front of the ligament of Winslow and behind the crucial ligament and passing a small tube through from one posterior incision to the other. The limb should be fixed on a splint in a slightly flexed position. Irrigation with salt solution, weak iodin, or other mild antiseptic should be carried out in the early stages, and if there is much inflammation hot fomentations are beneficial. The drainage tubes should be removed as early as possible, and gentle passive movements commenced as soon as active mischief has ceased. Great care must be taken to prevent the tibia from falling back on the femur while the wounds are healing and the ligaments still soft.

48. **New Physical Sign in Pneumothorax and in Pleural Effusion.**—Williamson's observation consists in the fact of the existence in these cases of a markedly diminished blood pressure in the leg as compared with that in the arm on the same side, a difference usually of a least 10 mm., and in many cases of over 20 mm.

51. **Purulent Bronchitis.**—An epidemic of a variety of purulent bronchitis was analyzed by Hammond and his associates. For the following reasons they consider the cause of the disease to be the influenza bacilli: (*a*) the almost constant occurrence of this organism in the sputum; (*b*) its presence in the pus of the affected bronchioles; (*c*) in some typical cases it occurs apart from the presence of any other organism; (*d*) the outbreak of the disease in epidemic form at the time of year when influenza epidemics are most common and while one was in progress; (*e*) the marked signs of toxic poisoning found during life and postmortem. There are well marked clinical features which distinguish these cases from ordinary cases of bronchitis. The most prominent are the characteristic sputum, the extreme tachycardia, the cyanosis, the course of the temperature (notably the antemortem fall), and the extremely high mortality. Treatment has so far been unsatisfactory. The most encouraging results have been obtained by the use of a steam tent. Vaccines have not yet had a trial, but the authors believe that it is unlikely, in view of the blocked condition of the bronchioles, that they would be of great benefit.

The morbid anatomy consists of three groups of changes. (*a*) The lung condition; marked purulent bronchitis, the smaller bronchi being filled with thick pus, from which air is notably absent. In some cases secondary bronchopneumonia and edema, pleurisy and emphysema are common; (*b*) evidence of toxemia; especially seen in kidneys, spleen, liver, lymphatic glands and heart muscle; (*c*) signs of right side heart failure and passive congestion. Some patients die of the toxemia and others of the cardiac failure. The histologic changes are those of an acute purulent bronchitis affecting the smaller bronchi with or without some surrounding catarrhal pneumonia. Degenerative changes are seen in other organs, notably in the kidneys, where the appearances of a toxic nephritis may be found.

52. **Marching Fractures.**—By a "marching fracture" is meant fracture of a second, third, or fourth metatarsal bone, or combination of these, in the right or left foot, caused by marching, and with no history of an accident. This fracture comes under the class of fracture caused by muscular action combined with indirect violence, and is caused by severe prolonged marching. The patient's feet become very sore, especially when standing up after resting. This indicates that the arch of the foot is giving way. The breaking of a metatarsal bone then takes place while marching. The patient does not know when the fracture takes place, as his feet are already so sore from the acute flat-foot. After the fracture takes place he struggles on for a time, but has finally to fall out. The exact cause of a marching fracture seems to be the following: In the normal foot the arch of the foot is so constructed that the bulk of the weight of the body is transmitted through the stout first metatarsal. The next strongest bone is the fifth metatarsal, which takes the next largest share in bearing the weight of the body.

When the arch falls down the weight of the body is distributed more equally to all the metatarsals, but the central ones being in more direct line with the astragalus get more than their share of the weight, and the second metatarsal, being in direct line with the head of the astralagus, gets the greatest proportion of the weight of the body. It receives more weight than it is constructed for, and under prolonged strain of long marching, when the soldier is carrying his full equipment, it gives way. When a person stands on his toes on one foot, the greatest breaking strain is near the head of the metatarsal bones, and this is the position in which the fracture occurs most frequently. It probably occurs when the man rises on to the toes of one foot to make a forward step with the other foot.

55. **Hemoglobin Value of Blood in Surgical Shock.**—The authors point out that surgical shock in man is frequently associated with considerable hemorrhage; and the normal reaction of the body to hemorrhage is the rapid absorption of fluid from the tissues into the blood. By this means the volume of the blood is more or less completely restored to its former level, although the blood becomes more dilute and its percentage hemoglobin value is lowered. It seems probable that in a patient suffering from both shock and hemorrhage the percentage hemoglobin value of the blood represents the outcome of two opposing processes, namely, shock, which tends to concentrate the blood, and hemorrhage which leads to dilution of the blood. Determination of the percentage hemoglobin value in such a case ought to show which of these processes is predominant; a low hemoglobin value may be regarded as indicating that the patient is spontaneously increasing the volume of his blood at the expense of his tissue fluids, whereas if the hemoglobin value is approximately normal the physiologic reaction to loss of blood is being counteracted by the tendency of shock to concentrate

the blood. The authors had the opportunity of determining the hemoglobin value of the blood in several cases of shock. They found that in shock accompanied by hemorrhage, a normal or approximately normal hemoglobin value indicates that the patient is unable to make up for the loss of blood by absorbing fluid from his tissues. In these circumstances the volume of his blood becomes inadequate for the carrying on of the circulation, and the intravenous injection of saline solution (preferably a hypertonic solution) is desirable at the earliest possible moment.

Practitioner, London

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59 Use of Roentgen Rays in Hyperactivity of Ductless Glands, with Special Reference to Exophthalmic Goiter, and Certain Forms of Ovarian Dysmenorrhea. F. Hernaman-Johnson.—p. 10.
60 Shock (Anaphylaxis). Disturbance of Normal Hydrogen Ion Concentration. J. E. R. McDonagh.—p. 19.
61 Moral Imbecility. A. F. Tredgold.—p. 43.
62 Some Indications for Nephrectomy. G. Taylor.—p. 57.
63 Pel-Ebstein Recurrent Pyrexial Type of Hodgkin's Disease (Lymphogranulomatosis Maligna). F. P. Weber.—p. 62.
64 Wassermann's Reaction. L. Cobbett.—p. 72.
65 Use and Value of Sulphur in Vaginitis. F. P. Gill.—p. 85.
66 Case of Malingering or True Neurosis; Case of Malingering or Hysteria. R. O. Townsend.—p. 88.
67 Abundant Presence of Bacillus Aerogenes-Capsulatus in Urine Unattended by Symptoms of Bacillary Infection, an Associated Occurrence of Renal Traumatism by Projectile. S. H. Bennett. —p. 92.

Archives des Maladies du Cœur, etc., Paris

May, X, No. 5, pp. 209-256

68 *The Oculocardiac Reflex. C. Laubry and P. Harvier.—p. 209.
69 *Action of Digitalis on High Blood Pressure. D. Danielopolu (Bucharest).—p. 228.

68. **The Oculocardiac Reflex.**—Laubry and Harvier discuss certain peculiarities of this reflex and the variability of the response in some persons. Compression of the eyeball excites the pneumogastric nerve; hence its effects are multiple and complex. They have been studying these effects on 150 persons, including a number of healthy subjects. The findings are tabulated and charted. They show that opposite responses may be obtained with a hasty and with a prolonged compression. They show also an inexplicable variety sometimes not only in different persons, but in the same person. On the whole, they warn of the necessity for being reserved in the clinical application of the findings. They may confirm the suspicion of unstable nervous conditions, especially in the pneumogastric system, but otherwise much reliance cannot be placed on them.

69. **Digitalis with High Blood Pressure.**—Danielopolu gives the details of thirty-six patients with high blood pressure from chronic aortitis, or arteriosclerosis with symptoms of interstitial nephritis. There was no dilatation of the right heart in any of the subjects and no other treatment was being given except the digitalis. The results confirm that small doses of digitalis may reduce the tension materially while the diuresis increases and the general condition improves. He ascribes the hypertension to accumulation in the blood of vasoconstricting substances (products of the suprarenals, and carbon dioxid), with resulting peripheral vasoconstriction, especially in the glomeruli. Hydremia is a further factor. Digitalis relieves the vasoconstriction, and the glomeruli relax which reduces the peripheral resistance directly and, indirectly, by increasing the diuresis and reducing the hydremia. Better functioning of the liver and lungs aids in the elimination of the vasoconstricting waste substances in the blood, and the vicious circle is broken up. Increased diuresis does not always occur even when the pressure shows a satisfactory reduction. The digitalis relaxes vasoconstriction at other points in the vascular system as well as in the kidneys.

Gottlieb and Magnus have demonstrated vasodilation in the extremities and in the brain under the influence of digitalis. Fraenkel and Magnus found also that stimulation of the pneumogastric reduces arterial tension, and digitalis is known to have a vagotonic influence. The doses of digitalis in the experiences here related varied from 30 to 90 drops of a French preparation taken in the course of two or three successive days the first week, and from 20 to 30 drops the following weeks or months. After having obtained the maximum of the desired effect, that is, the greatest possible drop in the tension, the effect is maintained with the smallest doses capable of keeping the blood pressure down and the subjective symptoms ameliorated. In some cases the blood pressure drops in a few days, in others not until after several weeks of treatment. In two of the cases reported the effects persisted after suspension of the drug. He never witnessed any phenomena indicating intolerance, even in patients who for more than two years had taken quite large doses of digitalis two or three days each week. When improvement has been realized, the drug can be dropped for a few weeks or months, ready to resume it as conditions demand.

Bulletin de l'Académie de Médecine, Paris

June 19, LXXVII, No. 25, pp. 777-796

70 A Gouty Tendency Leads to Sterility in Families. (De l'arthritisme, comme cause de l'infécondité.) E. Maurel.—p. 788.
71 The Pulmonary Prejudice against Ether. Mériel.—p. 794.

Paris Médical

June 23, VII, No. 25, pp. 517-532

72 *Evolution and Prognosis of Acute Nephritis in the Troops. E. Sorel.—p. 518.
73 *To Improve the Prognosis of Operations on the Stomach. V. Pauchet.—p. 520.
74 Anatomic Localization of Projectiles in the Tissues. A. Rabourdin and Samson.—p. 526.
75 Recurring Febrile Headache, with or without Meningeal Reaction. Gougerot.—p. 529.

72. **Acute Nephritis in the Troops.**—Sorel gives a typical example of each of the three main types of acute nephritis among the soldiers on active service. The nephritis assumes a different course when there are preexisting organic taints, arteriosclerosis, insufficiency of the liver, or alcoholism. Even when there is no special organic taint, the acute nephritis may recur after excessive fatigue or slight indigestion. The recurrence may be as severe as at first, or may appear in an attenuated form. In the third group of cases, the acute or subacute nephritis leaves permanent albuminuria, an evidence of weakness on the part of the kidney, or recovery may be complete. Of his eighteen cases, two were in men with already impaired health, and chronic nephritis is imminent. Four were in men of the second group, and seventeen in the third. Only five of the total eighteen are free from pathologic sequels.

73. **Surgery of the Stomach.**—Pauchet gives eleven illustrations showing the preferable technic for various operations on the stomach and remarks that the prognosis depends to an exceptional degree on the technical skill of the surgeon, the preparation and the aftercare. Patients with stomach trouble are more debilitated than others, as the derangement of the stomach has interfered with nutrition. Hence they require a week of preparation, with daily lavage of the stomach.

Presse Médicale, Paris

June 14, XXV, No. 33, pp. 337-344

76 *Glycosuria of Renal Origin. H. Roger.—p. 337.
77 Oiled Silk Chiffon in Treatment of Burns. P. Alglave.—p. 339.
78 Treatment of Partially Denuded Scalp. J. Labouré.—p. 344.

June 18, No. 34, pp. 345-360

79 *Treatment of Wounded Legs. L. Chevrier.—p. 345.
80 *Inflammatory Process in the Base of the Thorax. (Les costo-diaphragmatites discrètes dans l'armée et le syndrome de l'extrême base thoracique.) G. Mouriquand.—p. 348.
81 *The Sensory Achilles Tendon Sign with Sciatic Disease. G. R. d'Allonnes.—p. 351.

76. **Renal Glycosuria.**—Roger relates experiences which suggest that the kidney first stores up and then eliminates sugar. This is particularly evident when there is glycosuria in animals under the influence of epinephrin. In one such test, an hour afterward there was 2 per thousand sugar in the blood and 7.5 in the urine. After two hours, in the blood 1.3 and in the urine 40 per thousand. By the third hour, 0.3 per thousand in the blood and 1.75 in the urine. He describes a clinical case which, he says, is the fourteenth on record: showing pronounced glycosuria and symptoms of kidney derangement, edema of the face and polyuria, but the sugar

content of the blood seemed to be normal. Simple exaggeration of the permeability of the kidneys cannot be held responsible alone for the notable glycosuria observed, but at the same time the kidney element undoubtedly facilitates the glycosuria. He says that in the thirteen cases of renal glycosuria the sugar content of the urine varied from 1.2 to 24.8 per cent., while that of the whole blood ranged from 0.5 to 0.88, only one case showing 1.2. The range was thus within physiologic limits. Those patients with renal glycosuria that have been traced have shown nothing specially pathologic during the years since. Study of renal glycosuria has demonstrated that the liver does not have so much to do with the glycosuria of pregnant women as formerly supposed. It seems to be the result merely of exaggeration of the permeability of the kidney. In conclusion, Roger remarks that as calcium chlorid is said to reduce the permeability of the kidneys, it might be well to give it when the glycosuria is connected with some functional disturbance of the kidney.

79. **Management of Wounded Leg.**—Chevrier insists that the wounded must be kept from assuming a vertical position until the wounds of the leg are entirely healed. Healing is delayed when the person stands erect, even without bearing weight on the limb. He tells the men that the vertical position does as much harm to the tissues regenerating in the wound as if they were pounded with one's fist. If the men are too impatient to get up, he has their clothes taken away. From the very first day efforts are made to correct the attitude of the leg, as the men lie in bed, and to keep the muscles and joints in good functional condition, while preventing vicious attitudes in healing.

80. **Inflammation of the Diaphragm.**—Mouriquand mentions that in the last six months he has had 150 cases of what he calls discreet costodiaphragmatitis, and he here describes with illustrations the differential diagnosis and the treatment. The general tendency is toward spontaneous healing, although very slow; it can be followed by roentgenoscopy. In every case, rational breathing exercises and local heliotherapy are useful adjuvants.

81. **Achilles Tendon Sign of Sciatic Disease.**—D'Allonnes calls attention to the pain when the Achilles tendon is pinched if the sciatic nerve happens to be diseased. Adjacent tissues may be tender also, but the hyperalgesia of the Achilles tendon is more pronounced and more constant. He has found this sensory Achilles sign very useful in distinguishing between true and false sciatica. It is also interesting from the theoretic standpoint.

Progrès Médical, Paris

June 16, XXXII, No. 24, pp. 199-206

82 *Amnesia After War Wounds. R. Oppenheim.—p. 199. Conclusion.
83 Dystrophy of Muscles after War Wounds. H. Claude, A. Vigouroux and J. Lhermitte.—p. 204.
84 Consumptives in Fiction. Coudeyras.—p. 205.

June 23, No. 25, pp. 207-216

85 Epinephrin Test of Liver Functioning. M. Loeper and G. Verpy.—p. 207.
86 Acute Myelitis and Paratyphoid B. G. Etienne.—p. 209.
87 Trench Foot. P. Voivenel and P. Martin.—p. 212.

82. **The Amnesia after War Wounds.**—The first part of Oppenheim's article was summarized in these columns, page 321. He here describes cases of what he calls present amnesia or amnesia of fixation, and inability to concentrate the attention, as sequels of war wounds or shell shock. In study of such cases he has found that the Binet tests were beyond their reach. The only test that proved instructive was to have the man strike out a certain letter in a twenty line item, all the "r's," for instance, or separate into piles on a table 100 colored beads given him in a box, sorting them by colors. The traumatic amnesia seems to be always accompanied by a certain amount of mental depression. His experience has further shown that the war has not created any new morbid entities in this line; all the cases encountered fit into familiar frames, but never before have they been observed except singly. The dominant notes are the physical and psychic asthenia, the readiness to fatigue, the inability to keep up any sustained work, especially brain work, irritability and emotional instability. No connection between the site of the trephining and the gravity of the psychic disturbances could be discovered. The clinical picture, however, was strikingly like that of the amnesia of intoxications and auto-intoxications. The concussion and the emotional shock may have upset the balance of the glands with an internal secretion and thus started up an actual intoxication. Treatment must include general tonics and treatment for the nervous system, physiotherapy, psychotherapy, and daily measures to train the attention such as are used for backward children, with daily exercises to reeducate the brain and prepare for resumption of social life. All this requires psychologic and pedagogic training in the physician in charge of these cases. But men mutilated in the brain require the appropriate measures as well as those whose bodies have been mutilated.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 30, XLVII, No. 26, pp. 817-848

88 *Dermographism in Diagnosis. L. Schwartz.—p. 817.

88. **Dermographism in Diagnosis.**—Schwartz describes comprehensive study of the vasomotor response to circumscribed pressure on the skin. His subjects were a battalion of Swiss troops and patients in the surgical and internal wards of the Basel public hospital. He used a little spring instrument which showed the amount of pressure being applied, and gives an illustration of this ereuthometer. For peripheral dermographia he applies a pressure of 50 or 500 gm. The history, technic and findings with dermographism are reviewed, and the variations after a hot drink and after exercise are emphasized. The close dependence on external and internal conditions was somewhat of a surprise. This factor may prove misleading. The dermographic response may prove of great assistance in study of the effects on the vasomotors of the skin of the distribution of blood, the effect of local application of heat, of intoxications, of electricity, and of emotional factors. He classes both the "red line" and the "white line" as forms of peripheral dermographia. Müller in 1913 called attention to a third form, dermographia dolorosa or irritative reflex erythema. When the test causes a little pain, the redness is not restricted to the line or spot, but extends quite a distance beyond it. The livelier the pain, the greater the extension of the redness. This response is evidently of reflex origin. This assumption is confirmed by the opposite behavior sometimes of the simple peripheral and the painful dermographia.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 17, XXXVIII, No. 39, pp. 593-600

89 *Tabetic Pruritus. C. Vignolo-Lutati.—p. 594.

89. **Tabetic Pruritus.**—Lutati refers to the pruritus which may develop as the precursor of tabes, the first symptom to appear. He discusses the literature on the subject, and describes a typical case in a man of 52 who had contracted syphilis at 24 and had taken little if any treatment. Symptoms of tabes had developed at 41, and during the last year he had had attacks of pruritus. They were evidently tabetic equivalents, as they occurred during the intervals between the gastric crises and fulminating pains. The pruritus affected only the regions of the skin which were over the sites of the tabetic crises of pain.

Policlinico, Rome

June 24, XXIV, No. 26, pp. 813-840

90 *Hypertrophy of the Lingual Tonsil. G. Turtur.—p. 813.
91 Rupture of the Aorta. E. Soprano.—p. 816.
92 Diagnosis of Pneumonia. E. Guangiroli.—p. 820.

Medical Section, No. 6, pp. 229-268

93 *Familial Neuropathology. (Della sindrome atassica eredofamigliare e sue varieta.) R. Massalongo.—p. 229.
94 *Emotional Psychoneuroses in Soldiers at the Front. G. Pighini.—p. 243.

90. **The Lingual Tonsil.**—Turtur mentions that it has been suggested recently that the lingual tonsil may belong to the system of glands with an internal secretion. Be this as it may, its chronic catarrhal hypertrophy may entail consider-

able disturbance in both children and adults. There may be the sensation of a foreign body in the throat, difficulty in swallowing, retching, and various local and remote reflex trouble, asthma, or neuralgia, but a dry insistent rebellious cough is usually the most annoying and often a misleading symptom. In the case of an otherwise healthy woman of 30 with a healthy child, this inexplicable spasmodic cough was accepted as a symptom of apical tuberculosis until Turtur was consulted and found the lingual tonsil congested and enlarged. Under local treatment the cough subsided. This treatment is merely to paint with cocain the base of the tongue now and then. Only occasionally now the cough returns at night, accompanied with a sensation of spasm of the larynx. A sister of this patient presents symptoms of pluriglandular insufficiency, and the patient herself, after curetting of the uterus had profuse periodical uterine hemorrhages, suggesting disturbance in ovarian functioning. In another case the lingual tonsil became enlarged soon after the cystic ovary had been removed. The enlargement of the lingual tonsil was so considerable that cancer was suspected and the tonsil was removed, but no trace of malignant disease could be discovered in it. Notwithstanding the extreme enlargement there was never any cough in this case. The patient was a woman of 50, whose business required public speaking.

93. **Inherited Ataxia.**—Massalongo describes the case of a boy of 14 with extreme ataxia apparently intermediate between the Friedreich and the Marie types. The other children and the parents were apparently healthy, but the mother had inherited syphilis and still gave a positive Wassermann reaction. The boy also responded with a positive reaction to the Wassermann test in both blood and cerebrospinal fluid. There had evidently been some anomaly in the development of the microscopic structure of some portion of the cerebrospinal axis, condemning it sooner or later to exhaustion and degeneration, hastened by toxi-infectious or other causes of injury. Marie's disease and Friedreich's disease and their transitional forms are all to be regarded as effects from the compromised cerebellar system, its centers and its afferent and efferent tracts. They form a group of heredofamilial, cerebellar ataxia affections. Treatment as for syphilis generally comes too late.

94. **Emotional Psychoneuroses.**—Pighini presents evidence that a pure acute emotional psychoneurosis is accompanied in its initial phase with a state of autonomous miopragia and contemporaneous dysfunction of the sympathetic system. The latter in many cases is connected with abnormal functioning of the thyroid. This is manifested in some cases by symptoms suggesting exophthalmic goiter, in others by other symptoms of thyrosympathetic pathology. Symptoms of hysteria may be superposed, but they rarely develop as early as the independently functioning narrowing of the caliber of the blood vessels — the autonomous miopragia.

Riforma Medica, Naples

June 9, XXXIII, No. 23, pp. 609-628

95 Vaccine Therapy of Typhoid. M. Chiadini.—p. 609.
96 Temporary Protheses after Amputations. R. Falcone.—p. 616.
97 *Behavior of the Thyroid in Asphyxia. R. Pellegrini.—p. 617.

97. **The Thyroid during Asphyxia.**—Pellegrini has recently described the results of his study of the thyroid during asphyxia from the fumes of bromin. He here describes similar research with asphyxia of mechanical origin. The work was done on rabbits and dogs, and the changes in the thyroid in each group seemed to be characteristic of the type of asphyxia.

Tumori, Rome

January-March, V, No. 1, pp. 1-128

98 *Alien Tumor Grafts in Developing Embryo. G. Acconci.—p. 1.
99 *Proteolytic Ferments for Alien Proteins. A. Albanese.—p. 12.
100 The Pathologic Anatomy and Clinical Results of Resection of the Stomach. G. Fichera.—p. 40. To be continued.

98. **Transplantability of Foreign Tumor Tissue to Embryos.**—Acconci has been conducting research along the lines of Murphy's work with implanted tumor tissue in chicken embryo. He transplanted tissue from a rat adenocarcinoma and sarcoma, injecting a fine emulsion into the embryo still in the uterus. Rabbits and guinea-pigs were the animals used, and the gravid uterus was drawn out and flushed first with a 1 per cent. solution of novocain to inhibit reaction to the tumor emulsion. The latter was injected through the uterine wall directly into the ovular sac or embryo in the placental region. The uterus expelled its contents before term in nearly every instance, and the results were negative for this or other reasons in all but one case, so he has only one success to report. This was in a rabbit fetus and the tumor thus induced reproduced faithfully the structure of the mother tumor, a sarcoma in a white mouse.

99. **Proteolytic Ferments for Foreign Proteins.**—Albanese tabulates the data of forty-seven series of experiments which apparently have demonstrated that, beyond question, every animal species has preformed in the blood serum certain proteolytic ferments which have a destructive action on the proteins of foreign species of animals. He found them most actively destructive, in guinea-pig serum, for the proteins of rats and dogs, while they were less active for rabbit protein. They were also evident in mouse and rabbit serum against rat protein, but none could be demonstrated in rat serum destructive for mouse and rabbit protein. These proteolytic ferments therefore are polyvalent, capable of disintegrating proteins of various origins.

Brazil-Medico, Rio de Janeiro

May 5, XXXI, No. 18, pp. 149-156

101 Helminths in Brazil. (Contribuição para o conhecimento da fauna helminthologica Sul-Fluminense.) L. Travassos.—p. 149.
102 *Hair Disease in Brazil. (Piedra.) A. Moses.—p. 150.
103 *Loss of Entire Nose from Leishmaniosis. O. Torres.—p. 151.

May 12, No. 19, pp. 157-166

104 General Paralysis of the Insane; Nine Cases. O. Clark.—p. 157.

102. **Piedra.**—Moses has been studying hairs from over fifty cases of the disease of the hairs called piedra, and compares his findings with those reported by de Almeida last year during an epidemic of 500 cases. He obtained cultures from the gritty nodosities on the hairs in forty cases, and in all but two the *Trichophyton acuminatum escuro* developed; in seven cases it was associated with the vermiform colonies described by J. Renoy. He adds that piedra is common in Japan, and the "chignon disease" of the sixties was probably the same thing.

103. **Destructive Leishmaniosis.**—The illustrations of Torres' case show an elderly woman with absolutely nothing left of the nose or its bony framework. The destructive process was arrested by systematic treatment with tartar emetic, after failure of all other measures. The patient was 56 years of age, and of the highest social position in her town. She refuses a plastic operation and wears a false nose held in place with spectacles.

Prensa Medica Argentina, Buenos Aires

June 20, IV, No. 2, pp. 13-24

105 Total Colectomy for Chronic Ectasia. G. B. Arana.—p. 13.
106 Physiologic Action of Theraphosae Spider Venom. B. A. Houssay.—p. 18.
107 Acute Abdominal Affections. R. E. Pasman.—p. 19. Conclusion.
108 *Toxicity of Emetin. J. Guglielmetti.—p. 20.
109 Memoirs. E. R. Coni. Continuation.—p. 21.

108. **Toxicity of Emetin.**—Guglielmetti experimented with emetin from various sources, testing them on eight different species of animals and on pigeons. He tabulates the fatal dose for each by the subcutaneous, intramuscular, intravenous and intraspinal routes and by the stomach. His research confirmed the special toxic action of emetin on the myocardium and central nervous system, and that this is enormously greater by the intravenous than by other modes of administration. The fatal phenomena may develop without prodromal symptoms. Another fact to which he calls attention is that the animal apparently surviving a single dose may succumb suddenly several days later. The emetin was refound exclusively in the stomach, intestines and liver and their contents, whatever the mode of entry of the drug. It disappeared from the blood in three hours after intravenous injection. Consequently, it is not necessary to take

the grave risk of intravenous administration as the drug reaches the digestive tract by other routes as well. Baermann and Heinemann reported in 1913 that 0.4 gm. of emetin intravenously seems to be the maximal dose, and they recommend 0.25 gm. as the current dose. But some of the patients given this amount died about the fifteenth day, conditions thus closely resembling those in the experimental research related here. The final conclusions are that the subcutaneous is the proper route for injection of emetin hydrochlorid. He has given up to 0.15 gm. in this way daily for a week without inconvenience.

Revista Clinica, Medellin, Colombia

I, No. 1, pp. 1-42

110 *Epidural Injections in Treatment of Polyneuritis. B. Mejia.—p. 2.
111 *General Anesthesia by Rectal Injection of Ether. J. B. Montoya.—p. 23.

No. 2, pp. 43-101

112 *Nocturnal Incontinence of Urine. B. Mejia.—p. 43.
113 Sodium Cacodylate in Treatment of Syphilis. A. Soto.—p. 46.
114 *Intestinal Parasites in Colombia. E. Henao and G. T. Villa.—p. 57.
115 Pernicious Malaria. A. Mesa.—p. 71.
116 Creosote in Amebic Dysentery. M. M. Calle.—p. 73.
117 Gangrenous Appendicitis. A. Castro.—p. 81.
118 Medical Impressions of America. J. B. Montoya.—p. 89.

110. **Epidural Injections in Treatment of Polyneuritis.**—In Mejia's first case the polyneuritis developed late in convalescence from severe typhoid. The polyneuritis persisted for two months unmodified by the usual measures, but yielded to epidural injection of a 0.7 per cent. sodium chlorid solution, repeated six times in the course of twelve days. Relief was apparent from the first injection, but there was considerable atrophy of muscles. The second patient was likewise a robust young man. The polyneuritis developed twenty days after acute gonorrhea. The first two epidural injections, commenced the twenty-fifth day of the polyneuritis, did not seem to have any effect, but the cure was complete after the fifth.

111. **Ether by the Rectum.**—Montoya reports twelve patients anesthetized with a mixture of oil and ether. The technic is simple and efficient, but the irritation of the rectum is a serious drawback. Three of his twelve patients died with bloody diarrhea, undoubtedly the work of the ether, as the operations were on the jaw, uterus or leg. The amounts of ether used were from 100 to 150 gm. with 2 ounces of oil to 4.5 ounces of ether. He did not rinse out the rectum afterward and leave pure oil in it, as Gwathmey recommends, but mentions that in four cases reported from Bogota,, Gwathmey's directions were strictly followed, but dysenteriform diarrhea followed also in two cases.

112. **Epidural Injections for Incontinence of Urine.**—Mejia relates two instances of what may be called essential enuresis, occurring in children with a nervous taint. He comments on the remarkable change for the better in every way in the children when their enuresis was conquered and they felt they were like other children instead of being pariahs. They were boys of 13 and 10. One had also an irritable bladder which seemed also to be restored to normal by this reflex therapy as he calls it. He injected 10 c.c. of physiologic saline, a total of five or six injections, although the desired result seemed to have been obtained with the first three.

114. **Associated Helminths in Colombia.**—Henao and Villa report that in the course of examination of railroad employees and townsmen, a total of 200 persons, helminths were found in large numbers: ankylostoma in 88 and 48 per cent.; trichocephalus in 60 and 76 per cent.; amebas in 23 and 21 per cent., and the strongylus in 16 and 9 per cent. In 23 cases the ankylostoma and the trichocephalus were associated; in 7 the ameba and the trichocephalus and other associations were common. They say that in treatment of the trichocephalus the milky juice of the fig-tree (*leche de higueron*), seems to be the only treatment that proves effectual. This helminth seems to be responsible for the majority of the cases of chronic dysenteriform colitis among children in this district. They protest against the assumption that it is better to let the ascaris go untreated than to expose to the danger of santonin poisoning. It is not uncommon at Medellin for children to pass 200 or 300 ascarides. In conclusion, they remark that the total lack of medical statistics there renders it impossible to get reliable data of any epidemic, as, for example, of the typhoid epidemic of 1913. But it is their impression that intestinal hemorrhage and perforation were exceptionally frequent, and they query whether helminths may not have been responsible for this. The ascaris was found in 67 and 66 per cent. of their two groups of 100 persons each.

Semana Medica, Buenos Aires

May 3, XXIV, No. 18, pp. 511-538

119 *Ptosis of the Mamma. J. C. L. Massini.—p. 511.
120 Angioma of the Pharynx. R. Becco.—p. 513.
121 The Therapeutics of the Army Physician. J. A. Lopez.—p. 515.
122 *Treatment of the Pain with Laryngitis in the Tuberculous. A. Cetrangolo.—p. 517.
123 Lymphocytosis in Syphilitics. C. P. Mayer and A. C. Gourdy.—p. 520. Continuation.

119. **Ptosis of the Mamma.**—The woman of 35 had nursed her four children, but with her last two children the right breast had suppurated during lactation. The sustaining ligaments of the mammary gland had been partially destroyed by a series of abscesses and the gland and breast sagged down to below the umbilicus.

122. **Treatment of Pain with Laryngitis in the Tuberculous.**—Cetrangolo describes the various devices in vogue for insufflating an anesthetic powder for the throat. He prefers the Leduc tube, bending up the long end in a curve. But for durable effect he blocks the superior laryngeal nerve with alcohol, as he describes in detail. This has always proved successful in his experience. In case of need, the inferior laryngeal can be blocked also.

Siglo Medico, Madrid

June 16, LXIV, No. 3314, pp. 425-444

124 Inefficacy of Radiotherapy in Treatment of Simple Enlarged Glands. J. and S. Ratera.—p. 426.
125 Peptic Ulcer of the Jejunum. L. Urrutia.—p. 427. Continuation.
126 Diathermy in Gynecology. Poblacion.—p. 436. Continuation.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 19, I, No. 20, pp. 1623-1702

127 *Research on Striated Muscle Tonus and Its Innervation. II. (Spiertonus en ontherseningsstijfheid.) G. van Rijnberk.—p. 1623.
128 *Rheumatismal Aortic Valvular Disease and Myocarditis. W. Kouwenaar.—p. 1635.
129 Experimental Research on the Blood Pressure in the Vessels of the Nose. C. E. Benjamins.—p. 1647.
130 *Polyserositis with Sarcoma in the Abdomen of Young Woman. P. H. Kramer.—p. 1654.

127. **Innervation of Muscle Tonus.**—Van Rijnberk's experiments were made on cats and they are described with illustrations. The data recorded seem to suggest that all the tonic phenomena of striped, voluntary muscles entail an increase in the creatin content, and thus all must depend on one and the same chemical process. This can be elicited and maintained in different cases by the mediation of different nerves, some by the autonomic nerves, in others by the nerves of voluntary control of the muscles.

128. **Rheumatismal Myocarditis.**—A double plate shows the findings in two cases of rheumatismal myocarditis with aneurysm of the valves, causing aortic insufficiency. There were also numerous subcutaneous movable nodules scattered over the body, and similar lumps of lymphoid tissue were found in lungs, spleen and kidney as well as in the heart. Kouwenaar relates instances of similar lumps of lymphoid tissue found in various organs, including the brain, joint capsule, pia and bone. The patients were boys of 6 and 10, and the fatal acute verrucous endocarditis followed three or four months after the febrile rheumatism in the first case. The interval was over a year in the second.

130. **Polyserositis with Sarcoma.**—In Kramer's case the woman of 21 during the last two and a half years of her life had been tapped 198 times and a total of 1,040 liters of effusion had been withdrawn from the pleura, tapped 68 times, and the abdomen, 130 times. The sarcoma in the peritoneum was found inoperable when the physician first saw the case.

Hospitalstidende, Copenhagen

June 13, LX, No. 24, pp. 573-596

131 Myocarditis. L. S. Fridericia and P. Møller.—p. 573. To be continued.
132 Diverticula in Stomach and Duodenum. K. Secher.—p. 582.

Norsk Magazin for Lægevidenskaben, Christiania

June, LXXVIII, No. 6, pp. 641-768

133 Work as a Therapeutic Factor. (Om arbeidsterapien. Psykanalytiske strøtanker.) J. Strømme.—p. 641.
134 Rupture of Intestine from Contusion; Two Cases. C. Johannessen. —p. 664.
135 Traumatic Rupture of the Gallbladder. G. Gjestland.—p. 674.
136 *Colloids. E. Poulsson.—p. 686.
137 *An Ichthyosis Family. V. Magnus.—p. 703.
138 *Anaphylactic Shock after Injection of Diphtheria Antitoxin; Two Cases. T. Schønfelder.—p. 705.
139 Congenital Heart Defect. (Transpositio aortae et art. pulmonalis.) E. Platou.—p. 712.
140 *Optochin Amblyopia. I. Schiøtz.—p. 717.

136. **Colloids.**—Poulsson relates how the mystery of the colloids has been solved in recent years. Instead of being separate chemical bodies, they have been found to be merely suspensions in which the size of the particles ranges merely from one-thousandth to one-millionth of a millimeter. When the particles are smaller than this, we have the true solutions, as when sugar is dissolved, and when the particles are larger than this we have ordinary suspensions. The particles ranging from one-thousandth to one-millionth are too small to be seen directly in the microscope, but they may show up readily, even to the naked eye, as they catch the light, as dust motes show in a sunbeam entering a darkened room. Theoretically, any substance if divided into particles of this size will form a colloid in suspension in water or gas. Tobacco smoke, he says, is a colloid in gas form. Our atmosphere is a colloid of gas, water and dust particles. One of the most interesting features of colloids is that the solid particles of this size in them are always in lively motion, the Brownian molecular movement, when suspended in enough water. This molecular movement can be seen even in the small enclosed cavities in minerals opened up ages and ages after their first formation. The cause of the movement is not known, but chilling arrests it. Quite recent research is connecting the Brownian movement with the kinetic gas theory.

The enormous surface of the hosts of minute particles in a colloid, considered together, explains the process of adsorption, and possibly also the action of ferments and enzymes, which are colloids. Inorganic bodies can have a similar ferment action. The resemblance between them extends even to the fact that both can be paralyzed by certain poisons, prussic acid, for instance, and both can overcome the intoxication and resume their ferment action.

Living protoplasm is a colloid. Most colloidal solutions can solidify as a whole, and the jelly or gel holds its shape. This permits such living beings as the medusa, which consists of 95 per cent. water; certain water plants consist of 98 per cent. water, and parts of the human body contain 70 per cent. water. The different content of finely divided solids causes the blood to be a fluid while the muscle, which contains fully as much water, is a solid mass, and likewise the kidneys which actually show a higher percentage of water than the blood. The gel property of colloids is responsible for the setting of cement. Tungsten transformed into a colloid form permits the brittle metal to be drawn out into delicate wires for our electric lamps. Great efforts are being made now to prepare peat for fuel; as this is a colloid, the water cannot be squeezed out. The whole jelly mass escapes when pressure is applied, so that to date there is no process known except the tedious drying in the air. Among recent achievements in colloid chemistry is the transformation of the ill-smelling and easily decomposing whale oil into a hard white substance free from smell and absolutely durable. If this discovery had been made in time, he remarks, Germany might have prepared against the fat famine she has been experiencing. Salts and acids modify colloidal solutions. If the colloid is sufficiently dilute, under the influence of the salt it falls out of the water. This, Poulsson says, explains the delta of a river reaching tidewater. If the colloid is too concentrated for this, its avidity for water is increased. This is Fischer's explanation for edema, and it seems to explain the facts observed better than any other theory. The water is sucked up by the colloids and thus retained in the body.

The colloids which do not form gels are precipitated by electricity. He says that clouds are typical specimens of these suspension colloids, and their coagulation product, rain, is induced by electricity. The coagulation occurs with special haste and violence when there is much electricity in the air, as during the first drops of a thunder shower. In medicine, the two types of colloids are combined to make the product more stable, as in the making of collargol, for instance, albumin is utilized as a "protecting colloid."

137. **Familial Ichthyosis.**—In the family described, the ichthyosis was transmitted through the two sound daughters to their three sons, and through a sound daughter in the third generation to her three sons. None of the daughters of the four generations showed the affection, and the children of the sons were always free from it.

138. **Anaphylactic Phenomena after Injection of Diphtheria Antitoxin.**—Schønfelder reports what he thinks are the first cases of anaphylactic disturbance that have been published in Norway. In both there were restlessness, prostration and other symptoms of collapse, with urticaria in the milder case. This girl of 17 had been given 4,000 units by intramuscular injection four years after a similar injection. The other child, a boy under 3, was given 4,000 units by intramuscular injection five weeks after a prophylactic injection of 500 units. The collapse and other symptoms were quite alarming in this case, requiring subcutaneous injection of camphor, but there was no pronounced dyspnea, and no eruption followed. The threatening symptoms subsided by the end of the third hour.

140. **Optochin Amblyopia**—The history of the therapeutic use of optochin and its drawbacks is reviewed in detail by Schiøtz, who also reports a case of transient blindness in a sailor of 48 after optochin given for pneumonia. Vision is considerably reduced even now, but not enough to incapacitate him for his work. He is color-blind and the visual field is much restricted and the papilla grayish. There is also considerable hemeralopia. This seems to be the first case of optochin blindness reported in Norway.

Ugeskrift for Læger, Copenhagen

June 7, LXXIX, No. 23, pp. 899-940

141 *Comparative Research on Leukemia in Man and Fowls. V. Ellermann.—p. 899.
142 Treatment of Scabies. (Erfaringer over Fnatbehandling med Ungv. hepatis sulfuris.) M. B. Pedersen.—p. 909.

June 14, No. 24, pp. 941-996

143 *Focal Reaction after Injection of Tuberculin in Lupus. A. L. Fønss.—p. 941.

141. **Leukemia in Man and Fowls.**—Ellermann gives the clinical and necropsy findings in a case of myeloid leukemia in a man of 30 and compares them with the corresponding necropsy findings in a hen with leukemia, commenting on the remarkable parallelism between them, including the tumor formation. It seems evident that infection is able to induce hyperplasia of tissue of a more or less malignant nature. It it possible, he adds, that from the etiologic standpoint we must distinguish between typical leukemia and the atypical (leukosarcomatosis). Experimental research on hen leukemia seems to offer the solution to the question whether a new etiologic factor is superposed when leukosarcomatosis develops from a typical leukemia, and tumors form. It seems plausible to assume that some still unknown factor is responsible for the tumor production, but he has several times witnessed leukosarcomatosis develop in the course of typical leukemia, and is inclined to believe in their identity.

143. **Focal Reaction to Tuberculin in Lupus.**—Fønss expatiates on the diagnostic importance of a focal reaction to a test injection of tuberculin, as this locates the process. He has been studying it since 1912 in lupus patients — 104 in all. He tabulates the data from 76 cases. They show that 5 mg. is the proper dose to induce a focal reaction. If this does not induce a focal response, increasing the dose will rarely accomplish it. In seven of the seventy-six there was no reaction, and in eleven it was dubious.